

JOURNAL

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

In This Issue

GENERAL ARTICLES

- The Experimental Production of "X Disease" (Hyperkeratosis) in Cattle with Chlorinated Naphthalenes—*Dennis Sikes; J. C. Wise; Mary E. Bridges* . . . 337
- The Golden Rule in Veterinary Practice—*G. H. Ludins* . . . 345

SURGERY AND OBSTETRICS

- Permanent Intramedullary Pinning of the Femur in Dogs and Cats—*R. L. Leighton* . . . 347
- Functional Sertoli Cell Tumor with Metastasis in a Dog—*David L. Coffin; Todd O. Munson; Robert E. Scully* . . . 352
- A Two-Phase Method of Surgical Relief of Hydrops Amnii—*J. Wiley Wolfe* . . . 359
- Cervical Disc Protrusions in the Dog—*Sten-Erik Olsson and Hans-Jorgen Hansen* . . . 361

CLINICAL DATA

- Terramycin and Serum Therapy for Shipping Fever—*G. E. Hawley* . . . 371
- Brucella Suis Infection in Suckling and Weanling Pigs. I—*C. A. Manthei; C. K. Mingle; R. W. Carter* . . . 373
- A Comparative Study of the Reaction of Dogs as a Susceptible Species to Sublethal Doses of Aldrin and Dieldrin—*C. H. Kitzelman and A. R. Borgmann* . . . 383
- Clinical Study on the Subcutaneous Use of Calphosan—*William W. Putney* . . . 386
- Aspergillosis in Turkeys—*J. F. Witter and H. L. Chute* . . . 387
- An Outbreak of Bovine Tuberculosis in Mink and Treatment with Rimifon—*Fred B. Pulling* . . . 389
- Removal of Claws in the Domestic Cat—*A. G. Misener* . . . 390
- Different Forms of Swine Dysentery—*G. Schmid* . . . 391
- Terramycin Checks Calf Infections—*I. A. Schipper* . . . 393
- A Preliminary Report on the Etiology of Edema of Newborn Pigs—*George A. Young* . . . 394

NUTRITION

- Experimental Feeding of Senecio Silage to Calves—*P. H. Vardiman* . . . 397

EDITORIAL

- "Can We Stamp Out Disease?" . . . 401
- | | |
|---|-------------------------------------|
| <i>Surgery and Obstetrics</i> . . . 347 | <i>Editorial</i> . . . 401 |
| <i>Clinical Data</i> . . . 371 | <i>Current Literature</i> . . . 404 |
| <i>Nutrition</i> . . . 397 | <i>The News</i> . . . 407 |

AVMA Report, adv. page 8; Coming Meetings, adv. page 20

(Contents continued on adv. pages 2 and 4)

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CONTENTS

(Continued from Cover)

SURGERY AND OBSTETRICS

Gonadotrophin for Ewes	351
Uterine Suction During Coitus	351
Effects of Stilbestrol on Swine	359
Fertilizing Capacity of Spermatozoa	360
An Unusual Case of Dystocia	370
Postoperative Hernia in the Dog	370
Prolonged Gestation in Two Cows	370

CLINICAL DATA

Antibiotics and Leptospirosis	372
Salmonellosis in Man	372
Gamma Globulins for Poliomyelitis	382
Treating Blackhead in Turkeys	388
Volvulus in the Cow	388
Toxicity of Copper for Cows	390
Tail Chewing in Mink	390
Contagious Ecthyma Infection in Man	393
Erysipelas in Lambs	396

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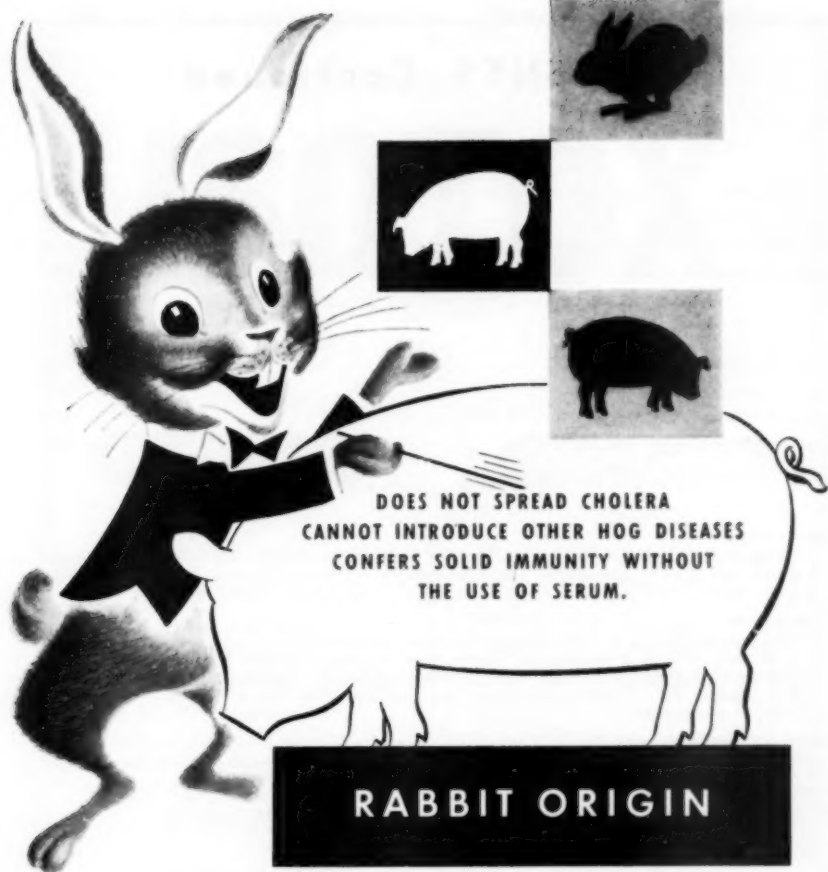
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\$7.50 per annum Foreign \$8.00; Canada \$8.00 Single Copies 75 cts, Prepaid in U.S.

Published monthly at 600 S. Michigan Ave., Chicago, Ill., by the American Veterinary Medical Association. Entered as second class matter August 10, 1932, at the Post Office at Chicago 5, Illinois, under the act of March 3, 1879. Additional entry at Mendota, Ill. Accepted for mailing at special rate of postage provided for in Section 538, act of February 28, 1925, authorized August 10, 1932. Reproduction of any part of this publication is prohibited, unless special permission is given. Permission will be given if the purpose seems justifiable and, in signed articles, if the rights or requests of author are not violated thereby. Reprints should be ordered in advance. Prices will be quoted after publication. Please send prompt notice of change of address, giving both old and new. Advise whether the change is temporary or permanent. Address all correspondence to American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill.



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CONTENTS—Continued

NUTRITION

Over-Ripe Hay and Grasses Not Digestible	400
Vitamin A Storage	400
Influence of Tocopherol on Vitamin A	400
Ladino Pasture for Hogs	400

EDITORIAL

Cornstalk Poisoning	402
Ethics Among Veterinarians	403
Swine Association Criticizes Control of Vesicular Exanthema	403
Anthrax Outbreaks	403

CURRENT LITERATURE

ABSTRACTS

Effect of Low Temperature on Liver Fluke Eggs in Beef Livers, 404; Study of Telangiectasis, 404; Canine Brucellosis, 404; Chemotherapy of Enterohepatitis of Turkeys. I, 404; Some Aspects of Congenital Passive Immunity to Newcastle Disease in Chicks, I, 404.

FOREIGN ABSTRACTS

Effect of Antibiotics on Bull Semen, 405; Avian Tuberculosis in a Cow, 405; Lymphangitis in Horses, 405; A Transfixation Plaster Cast for Small Animal Fractures, 405; Intra-Abdominal Anesthesia in Pigs, 405; A New Outbreak of Newcastle Disease, 405; Hard Pad Disease, 406; Neurolymphomatosis and Leukosis, 406; Zinc Phosphate Poisoning of Game Animals, 406.

BOOKS AND REPORTS

Public Health and Welfare in Japan, 406; Instructor's Guide, Sanitary Food Service, 406.

REVIEWS OF VETERINARY MEDICAL FILMS

Protecting Poultry Profits, 406.

THE NEWS

AVMA Initiates Placement Service to Separated Officers	407
Addition to 1952-1953 Roster	407
U. S. Government	407
Women's Auxiliary	407
Applications	410
Among the States and Provinces	411
Foreign News	417
Veterinary Military Service	419
Births	419
Deaths	419

MISCELLANEOUS

Could Equine Infectious Anemia Be Leptospirosis?, 344; Burn Therapy, 344.

Correspondence adv. page 44

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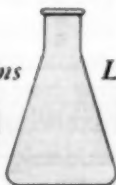
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AVMA ☆ Report

Veterinary Medical Activities

◆ President W. L. Boyd represented the AVMA at the dedication of the new laboratories of the Mayo Foundation for Medical Education and Research in Rochester, Minn., on September 26, at which time a hall in the new building was named in honor of Dr. Frank C. Mann, for many years director of the Division of Experimental Surgery and Pathology of the Foundation.

◆ The planning of the scientific program for the Ninetieth Annual AVMA Meeting scheduled for July 20-23, 1953, in Toronto, Ont., began in the central office on Sept. 19 and 20, 1952. The secretaries of all sections (*see* Roster, p. 328, October, JOURNAL), except Public Health, met with staff members; also present were Drs. A. G. Misener, L. E. Fisher, Mr. Walter Lawrence, and Mr. John Jewett. Plans were made for what should be the best program ever presented at an AVMA convention.

◆ Representatives of the AVMA Committees on Therapeutic Agents and Veterinary Items of the National Formulary worked all day September 17 in the central office on recommendations to be made to the Food and Drug Administration relative to drugs that should bear prescription labels. Those present were Drs. Robert C. Glover, Evanston, Ill.; L. Meyer Jones, Ames, Iowa; Fred Kingma, Columbus, Ohio; Roger P. Link, Urbana, Ill.; W. A. Aitken and C. D. Van Houweling of the AVMA staff.

◆ The letter recently sent by President W. L. Boyd to all members was the first in a series authorized by the Board of Governors to go to members from officers and the staff. These letters will be used periodically to bring to members messages of special interest relating to the AVMA, professional, or veterinary medical developments.

◆ The Board of Governors (President W. L. Boyd, President-Elect James A. McCallam, and Executive Board Chairman Edwin Laitinen) met in the central office on October 16 and 17. Representatives from the Public Relations Committee met with the Board on October 16.

◆ The AVMA Emergency Advisory Committee has initiated a resettlement service for Veterinary Corps officers being separated from the Army and the Air Force. Any officer separated prior to the inauguration of this service, who still desires assistance, is invited to write to the Committee at 600 S. Michigan Ave., Chicago 5, Ill.

◆ The U.S. Livestock Sanitary Association held a meeting to discuss vesicular exanthema in the AVMA conference room on September 22. President R. L. West and Secretary R. A. Hendershott of the U.S.L.S.A. and about 30 other state and federal officials were present. Dr. Jacob Traum of the University of California, who first recognized the disease as a separate entity, and Drs. B. T. Simms, S. O. Fladness, F. J. Mulhern, and R. K. Somers from the BAI were present to answer questions. At least 12 states were represented by their livestock sanitary officials.

◆ Editor-in-Chief Aitken attended the annual short courses for veterinarians at Purdue University on October 1, 2, and 3, and at the University of Missouri on October 6 and 7. At each conference, he discussed swine diseases and presented greetings from the AVMA.

◆ More than 95 per cent of the 1952 graduates of the 19 schools of veterinary medicine in the United States and Canada have applied for membership in the AVMA. Applications are on file for 100 per cent of the graduates from 11 schools and from 80 to 95 per cent of the graduates of the other eight schools. This is a new record.

◆ Executive Secretary Hardenbergh attended the annual meeting of the Pennsylvania State Veterinary Medical Association in Pocono Manor, October 8-10. On the same trip, he represented the AVMA at a meeting of the Board of Directors of the National Health Council in New York City on October 10.



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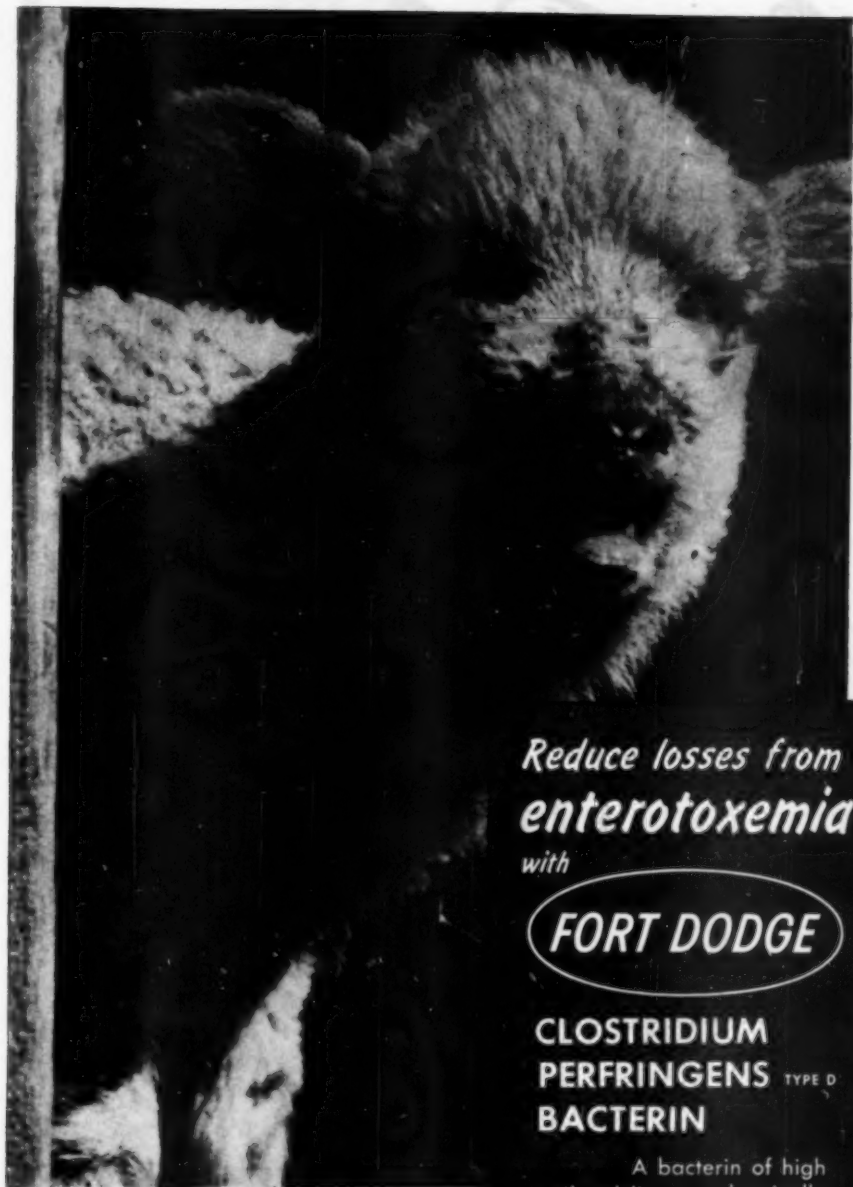
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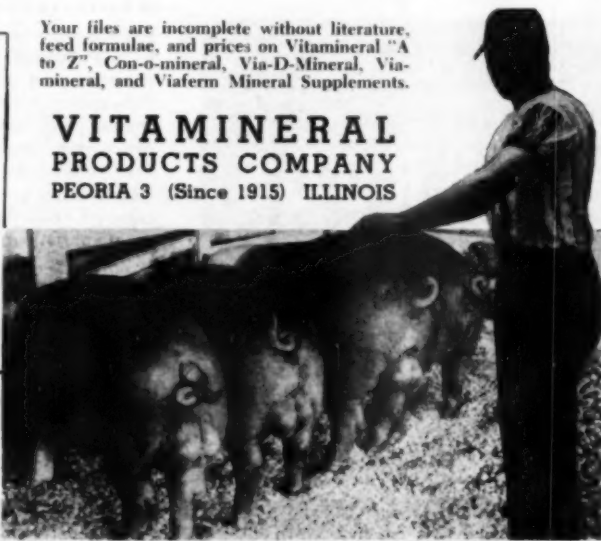
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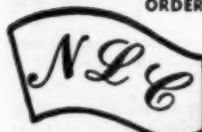
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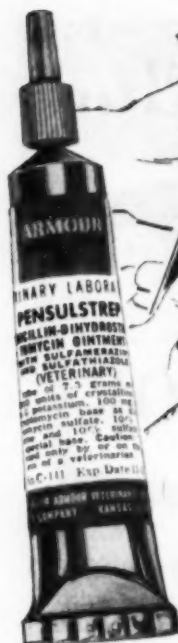
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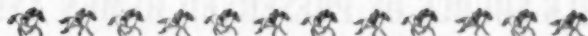


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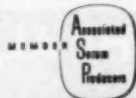


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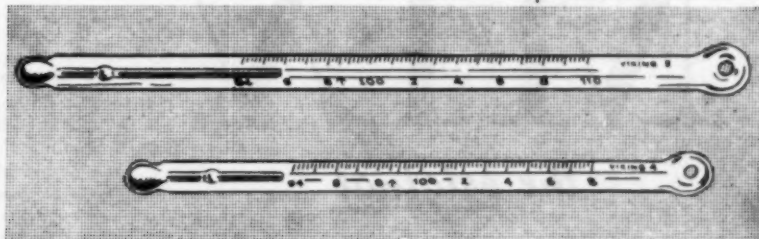
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VOL. CXXI

NOVEMBER, 1952

No. 908

The Experimental Production of "X Disease" (Hyperkeratosis) in Cattle with Chlorinated Naphthalenes and Petroleum Products

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Knoxville, Tennessee

"X DISEASE," or hyperkeratosis of cattle, the mysterious and baffling disease, has cost cattle producers many millions of dollars. It is conservatively estimated that cattle worth more than \$4,000,000 have died or had to be slaughtered because of this malady in the southeastern part of the United States. In Tennessee alone, more than 3,000 animals valued at more than \$1,000,000 have been lost due to the ravages of this disease. Olafson¹ first recognized the disease in New York State and later described it in 1947. Since that time, it has spread rapidly to all states east of the Rocky Mountains. A number of valuable purebred herds have been affected and the raising of calves in some herds became impossible over a three-year period. Because of this malady, affected herds were slaughtered.

Olson and Cook² produced the disease in cattle by feeding a commercially prepared feed which had been incriminated in an outbreak of the disease in a herd of cattle in Nebraska. Wagener³ produced the disease in Germany by exposing cattle to a complex wood preservative used in the con-

struction of a new barn. Olafson and McEntee⁴ also produced the disease in cattle by feeding a processed concentrate. Bell⁵ produced the disease in calves by feeding a lubricant. Sikes and Bridges⁶ produced the disease in 3 yearling heifers by daily administration of a proprietary, refined, highly chlorinated naphthalene.

EXPERIMENTAL PROCEDURE

Experiment 1.—Two 10-month-old yearlings (1 Jersey-Hereford crossbreed, 1 Holstein-Friesian) were used in this experiment. These calves were allowed to nurse their dams for the first three months of life and then were placed on a commercially prepared calf starter with choice of alfalfa hay. They made excellent growth and weighed about 475 lb. each at the beginning of the experiment. One calf was used as a pilot test and was given a proprietary, refined, chlorinated naphthalene having a chlorine content of 62 per cent (essentially hexachloronaphthalene) at the rate of 3 Gm. per day in capsule *per os* for twenty days. This procedure was followed in an attempt to find a toxic dose which would kill the animal in a short time. This animal was autopsied on the twenty-seventh day because of its morbid condition. With this knowledge of the toxicity of the chlorinated naphthalene established, the other calf was given 1 Gm. per day for thirty days, and then 2 Gm. per day for thirty days *per os* in capsule. Thus, this animal received 90 Gm. over the sixty-day period.

Experiment 2.—(a) A 4-year-old Guernsey cow, weighing about 900 lb., and her 2-month-old bull calf were used in the first part of the test. The cow was given 5 Gm. per day of octachloronaphthalene in capsule *per os* for eighteen days. The calf was allowed to nurse its dam but was kept separate

A contribution from the inter-regional project entitled "X Disease (Hyperkeratosis of Cattle)," a cooperative study participated in by the Agricultural Experiment Stations, the Bureau of Animal Industry, U. S. Department of Agriculture, and the Tennessee State Department of Agriculture.

Gratitude is expressed to Dr. I. R. Davis, assistant director, U. S. Animal Disease Research Laboratory, Auburn, Ala., for microphotography.

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from the cow, and none of the compound was administered to it.

b) A Jersey bull 8 months of age, weighing about 450 lb., was given 1 Gm. of octachloronaphthalene in capsule *per os* for thirteen days.

Experiment 3.—(a) A grade Holstein-Friesian bred heifer weighing about 550 lb. was given 5 Gm. of a well-known brand of chassis lubricant in capsule *per os* for eight days, then 10 Gm. per day for five days, and then 20 Gm. per day for twenty-eight days.

b) A 3-month-old Guernsey bull calf weighing about 200 lb. was given 5 Gm. per day in capsule *per os* of the same lubricant for sixteen days.

Experiment 4.—(a) A 4-year-old Jersey cow had 250 cc. of used tractor crankcase oil applied to the vertebral column once each week for eight weeks. Thus, 2,000 cc. of the oil was applied over the eight-week period. This cow was in the fourth month of lactation and her calf and one other calf of comparable age and size were allowed to nurse her. No oil was applied to the calves.

b) A Guernsey heifer 9 months of age and weighing about 450 lb. was given 20 cc. of the used tractor crankcase oil per day in capsule *per os* for thirty days. This animal received a total of 600 cc. of the oil.

All the older experimental animals received good quality alfalfa hay and a commercially pre-

pared dairy feed. The calves received a calf starter and alfalfa hay. All animals were in good health and excellent growing condition at the beginning of the experiment.

The control animals remained healthy and made good growth rates during the experiments.

EXPERIMENTAL RESULTS

Symptoms observed in these experimental animals were identical with those observed in naturally occurring field cases. They were excessive lacrimation, diarrhea, polyuria, marked salivation, and a serous discharge from the nostrils. A chronic cough, poor appetite, and numerous macules in the buccal cavity, on the lips and in the nose, developed by the fortieth day. Some of the macules became 30 mm. in diameter, with proliferations of the underlying tissues. Hyperkeratosis had developed by the fiftieth day with many wartlike proliferations on the lips, tongue, and hard palate.

At necropsy, marked generalized hyperkeratosis had developed. The skin was hard and dry, and fissured rolls developed across the withers and sides of the neck (fig. 1, 2). The lips, gums, tongue, external



Fig. 1.—Note loss of hair on neck and withers, with formations of rolls of skin in early stages of disease.

nares, and muzzle contained numerous proliferative areas (fig. 3). The abomasum was greatly inflamed, swollen, and edematous, with many superficial ulcers 5 to 30 mm. in diameter. Near the pylorus, the ulcers were larger, extending deep into the muscle layers. Gastric secretions obviously had long been interfered with, and perhaps completely inhibited.

A marked enteritis was noted throughout the upper one-third of the small intestines. Numerous small denuded areas 5 to 10 mm. in diameter, with a fibrinous membrane over their surfaces, were present. The pancreas was hard, firm, and swollen and showed evidences of excessive connective tissue on cross section. The liver edges were rounded and slightly thickened. The distended gall bladder was filled with a thick, viscid, dark colored bile and the walls were markedly thickened. Numerous mucous cysts were observed in the large bile ducts. In the kidneys, subcapsular, clear, cystlike structures were observed in the cortical portion.

The petroleum products (chassis lubricant and used crankcase oil) both produced advanced cases of x disease or hyperkeratosis with pathological changes similar to those produced by chlorinated naphthalenes.

Histopathological changes observed in the livers were fatty degeneration of the parenchymatous tissue (fig. 4), and a

thickening of the trabeculae and bile duct walls. Numerous areas of proliferating terminal bile ducts (fig. 5) with areas of proliferating, cystlike structures around the wall of some of the large ducts were present. In the gall bladder, numerous proliferating, cystlike structures were prominent, with the cells of an inflammatory reaction infiltrating these areas. Also, dilation of the glands was pronounced. As in the liver, the first cellular change observed in the pancreas was fatty degeneration of the cells of the acini of the gland (fig. 6). Later, massive connective tissue infiltration developed with atrophy of the acini (fig. 7 and 8). In the kidneys, marked dilation of the collecting tubules with sloughing of the lining cells was pronounced (fig. 9). Also, a moderate degree of fibrosis occurred. Marked keratinization of the hair follicles with an excessive accumulation of keratinization of the hair follicles with an excessive accumulation of keratinized material on the epidermis was observed in the skin. The papillae were elongated in finger-like projections with numerous degenerating cells present on their terminals (fig. 10). There was also a reduction in the thickness of the Malpighian layer.

DISCUSSION

Chlorinated naphthalenes have been used in industry for many years. However, only

Fig. 2—Later stages of disease with mucous streaming from nostrils, also note large rolls of skin with fissures in them.



within recent years have the members of the higher chlorinated series been brought into use. No sooner had they been put to use by industry than complaints began to arise by the workers who were handling them. Mayers and Silverberg², Sulzberger, Rosenberg, and Scher³ described the condition in man as "cable itch." German physicians described the poisoning under the name "chlorachne" caused by "perna" a mixture of these compounds. A more recent report of epidemics of "cable rash" was described by Schwartz⁴ as occurring in shipyards during World War II among electricians stripping cables coated with these substances.

These waxes are fire-, heat-, and water-resistant. They have many uses in industry, i.e., as electrical insulators for wires, coils, and small transformers. They may be used as additives to lubricants and crankcase oil to improve the load-carrying capacity. They are used as additives to cutting oils. They also may be used as contact insecticides for greenhouse use. Under modern animal husbandry practices in the United States, cattle may be exposed to a number of possible sources of these compounds. Crankcase oil, for example, is widely used on cattle and swine as an insecticide. Tractors, harrows, combines, hay-

presses, and other farm equipment using lubricants are left so that cattle may lick the grease or the ground where the lubricants are left so that cattle may lick the grease or the ground where the lubricants have dropped off. Also, oil cans and lubricant buckets are left where cattle can lick them.

In experiments 1 and 2, no attempt was made to find the minimum toxic dose of the chlorinated naphthalenes. Perhaps even smaller amounts will produce the disease in all of its manifestations. However, since the objective was to find out whether the chlorinated naphthalenes would produce the disease, a reasonable dosage was used. In experiment 2 (a), the Guernsey cow receiving the octachloronaphthalene had a marked reduction in milk flow by the seventh day and cessation of flow by the twenty-ninth day. The animal was autopsied on the forty-second day. Many proliferations were present in the mouth, nose, and bile ducts. Marked dehydration of the skin occurred, but no hyperkeratosis.

The calf was given milk from the University of Tennessee dairy herd as soon as the dam failed to give enough for it. It was autopsied on the fiftieth day, and found to have moderate hyperkeratosis. This calf was kept separate from the cow



Fig. 3—Massive proliferations in left nostril, muzzle, and lips.



Fig. 4 — Degenerating liver cells. x 20.

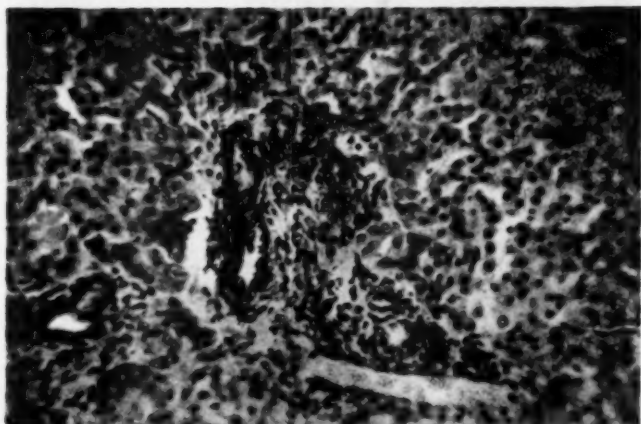


Fig. 5 — Proliferating bile ducts and thickening of main duct wall. x 20.

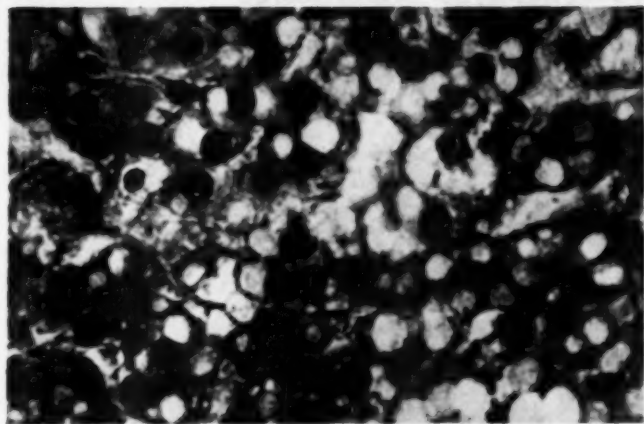


Fig. 6 — Fatty degeneration of the cells of the acini of the pancreas. x 40.

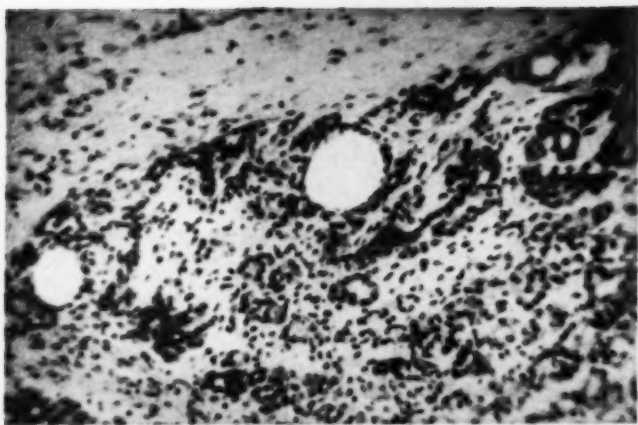


Fig. 7—Fibrous tissue infiltration with compression of the acini of the pancreas. x 40.

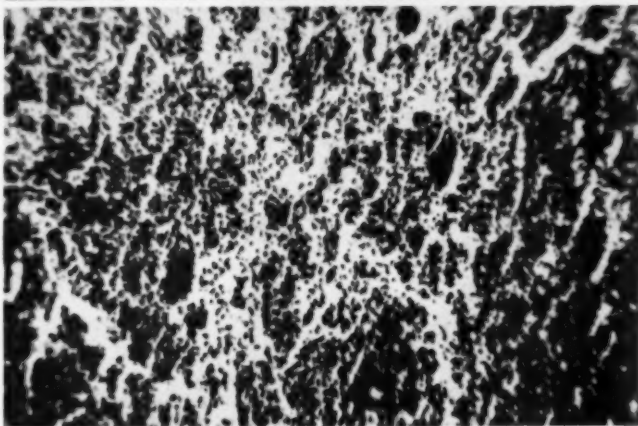


Fig. 8—Fibrous tissue infiltration of pancreas. x 20.

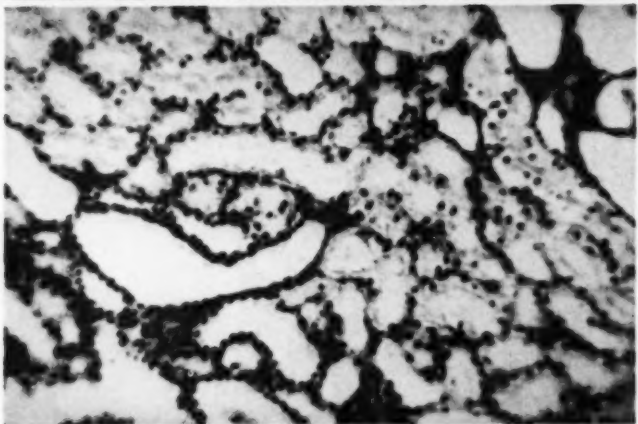


Fig. 9—Marked degeneration and dilation of the collecting tubules of the kidneys. x 20.

except when nursing. This indicates that the toxic substance (or other toxic substances formed in the body as the result of ingestion) is liberated in the milk.

In experiment 2 (b), the Jersey bull which received 1 Gm. per day of octachloronaphthalene for thirteen days developed moderate hyperkeratosis and died on the fifty-seventh day.

The bred grade Holstein-Friesian heifer which received the chassis lubricant in experiment 3 aborted on the forty-seventh day and died of hyperkeratosis on the seventieth day. This experience is similar to field observations that many pregnant animals do abort or have dead calves at full-term pregnancy when the animals become affected.

The 3-month-old Gurnsey calf which received 5 Gm. of the above chassis lubricant per day for sixteen days died on the thirtieth day. Mouth lesions had developed and two proliferations in the bile ducts were present, but no hyperkeratosis. Obviously, the dose administered was too great and killed the calf before hyperkeratosis had time to develop. This is significant for two reasons. First, one of the authors (Sikes) scraped more than 120 Gm. of this lubricant off the hub of the wheel of a combine where the lubricant had been oozing out and calves had licked the other three wheels clean. Second, it is a common observation in field cases that where calves lick lubricants off farm machinery, or certain used crankcase oils have been applied to their backs as an insecticide, many die before hyperkeratosis develops.

In experiment 4 (a), in which the 4-year-old Jersey cow had received 250 cc. of used tractor crankcase oil on the vertebral column, there was never any evidence of the animal's licking the oil off her body. Also, there was never any evidence that the 2 calves licked any of the material off her body or rubbed it on themselves. The experiment will be repeated, with the animal's heads tied to prevent the possibility of licking. The animals will be milked by hand and the calves given the milk from a pail. The cow and both calves developed advanced cases of hyperkeratosis. This is additional evidence to support the supposition that the toxic substance or substances are liberated in the milk. Also, the evidence suggests that absorption through the skin does take place.

The used tractor crankcase oil seems to be equally toxic when administered in capsule *per os*. The Gurnsey heifer receiving 600 cc. of the oil developed an advanced



Fig. 10—Excessive keratin formation of the skin. Papillae in finger-like projection with terminal degenerating cells. x 20.

case of x disease or hyperkeratosis. It is possible that oral administration of the oil will prove more toxic than skin absorption. Both routes, however, proved to be satisfactory ways of administering the oil to produce the disease.

In all of these toxicological tests, marked lacrimation, salivation, and polyuria occurred. Macules formed on the lips, gums, and hard palate. These later proliferated in varying degrees. Usually, a diarrhea developed shortly after macule formation in the mouth (fig. 10). In the later stages, a craving for salt and water was evident.

SUMMARY

"X disease," or hyperkeratosis of cattle, has been experimentally produced in cows, yearlings, and nursing calves by the admin-

istration of two refined, highly chlorinated naphthalenes. They were administered in small repeated doses in capsule *per os*, by daily doses of a chassis lubricant, and by applying weekly doses of a used tractor crankcase oil to the back of a cow. Evidence is presented to show that: (1) The physiological and pathological responses in the animals receiving the petroleum products are similar to those receiving the chlorinated naphthalenes. (2) The toxic substance (or other toxic substances formed in the animal's body as the result of body intake) is liberated in the milk. (3) There is a great difference in tolerance on a body weight basis of these animals to these compounds. (4) The greater the degree of chlorination of naphthalene, the more toxic the compound becomes. (5) Skin absorption of the toxic substance or substances may be effected by applying used tractor crankcase oil over the vertebral column. (6) The chassis lubricant produced an abortion.

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- Listeriosis seems to be enzootic in some flocks of Wisconsin sheep. Newly introduced animals soon develop it and the virulence seems then to be increased so that the disease may recur in others. —T. Moll, D.V.M., University of Wisconsin.

Could Equine Infectious Anemia be Leptospirosis?

There is much human leptospirosis in the rice-producing district of Italy. Equine infectious anemia also frequently occurs there. Serological tests were taken on two groups of horses. Reactors were found only in the group of horses which had shown illness.—*Vet. Bull.*, Aug., 1952.

Burn Therapy

Deaths from burns and scalds were several times as high forty years ago as they are today. The Navy reports that the fatality rate dropped from 22.9 per cent in World War I to 8.7 per cent in World War II. From 1936 to 1940, the civilian death rate was cut in half. Fatalities are usually due to shock rather than to surface tissue destruction. Officials estimate that burns probably cause half the fatalities and three-fourths of all casualties from atomic bombings.

The greatest change in burn therapy in recent years has been the virtual abandonment of the once popular tannic acid coagulation procedure. It apparently increased the disfigurement and caused serious liver damage. Present concepts stress (1) surgical cleanliness to prevent infection; (2) compression of the injured area to prevent fluid loss; and (3) rest. Some advocate a gentle cleaning with a quaternary ammonium compound or mild soap solution, then the application of sterile petrolatum gauze followed by a moderate pressure bandage. This may be left in place for long periods. For mass treatment, dry dressings which can be applied quickly by relatively untrained persons are advocated.

Recently, an open or exposed treatment is being tried. It includes hospitalization, penicillin, with the elevation and full exposure of burned areas. It is experimental and is highly controversial at the moment.—*J. Am. Pharm. A.*, Aug., 1952.

A new vitamin has been discovered at the U.S.D.A.'s poultry nutrition laboratory at Beltsville, Md. It promotes rapid growth in young chickens even when all known required nutrients were present in the ration. The new factor is found in fish solubles, fish meal, and meat meal. —U.S.D.A.

The Golden Rule in Veterinary Practice

G. H. LUDINS, D.V.M.

Hartford, Connecticut

Before World War II, the inter-relationships of individual veterinary practitioners in the city of Hartford, Conn., and the territory surrounding it were about on a par with the rest of the country. In fact, it was probably better than a lot of other communities. Most of the half dozen or so men practicing in this area before the war were at least on speaking terms, and not too much backbiting and knocking were in evidence. Rarely did one hear the old saw, "if we had had the dog from the beginning and hadn't lost all that valuable time." It was a case of live and let live around these parts, and that was better than could be said for most places where two or more veterinarians practiced in the same territory.

WORLD WAR II CHANGED SITUATION

After the war, however, it wasn't good enough. There was the great influx of new men, of young men just released from the Army as captains, majors, and colonels — good men, but strangers to the community of practicing veterinarians and unversed in the give-and-take of living together in that community. There were bound to be frictions between the new and the old, more from ignorance than from intent. The older men, as individuals, were always glad to advise and help if they were asked, and the newcomers, in many cases, did ask for advice and help. That was fine, but it wasn't enough. Not enough to build a lifetime of happy coexistence, based on an active cooperation. It needed a little more than that. And, through the use of common sense and fair play and old fashioned friendship, the situation was changed from a haphazard and casual tolerance to an active and aware cooperation that benefited not only the old men and the new men, but also the community and the animals in it.

A NEW SOCIETY WAS BORN

The beginnings were informal and were based on a telephone conversation between two of the group regarding a fee for a certain surgical operation. The two agreed

that it would be a good idea if all the veterinarians of greater Hartford got together and discussed ways and means of making a better professional life for all of them. A phone call to each of the men resulted in a meeting on Jan. 20, 1947—and the Greater Hartford Veterinary Medical Society was born! It was unique in that there were no officers, no constitution, no by-laws, and no dues. And no politics! It was simplicity itself; the most formal and complicated part was the name. It was decided to hold meetings once a month at the office or home of a member, and the alphabet determined the rotation of the meetings. The rotating chairman furnished the meeting place, the entertainment, the speaker, and the refreshments. The first meeting or two dealt with ethics and relationships between the members, and, incidentally, with a schedule of minimum fees. This was not a method of price-fixing, as there was no upper limit established. It simply set a fair minimum below which the members pledged themselves not to go. It has been a source of frustration to the telephone shoppers, and it has resulted in added dignity to the profession, since cut price tactics do not tend to elevate any profession or business.

FUTHERING EDUCATION OF MEMBERS

After the formalities of organization and the establishment of an ethical standard were disposed of, it became necessary to look toward furthering the education of the members. The national and state organizations were able to perform this function on a broad basis, but the group felt that something on a personal level would be of great value. As a result, we were able to get men from other professions to come to our meetings and share their knowledge with us. We found them extremely cooperative and always glad to appear on our programs. We have had men from almost all the specialized medical fields—cardiologists and internists, orthopedists and roentgenologists, dentists and surgeons. Without exception, we met these men on their own level and found them aware of

the fact that we were their peers and equals in our own field, and that our field was not too unlike theirs. To some of the speakers, it came as a shock that we were able to speak their language, and that point alone made the project worth-while, because it established in their minds the fact that the veterinary profession is a full-fledged member of the medical group. So, in a certain sense, the educational aspect of our meetings has been a reciprocal affair, with benefits accruing to both parties.

INITIATION OF "WEEK-END" AND VACATION PLAN

Early in the history of our group, it became apparent that we would have to provide for better coverage during vacations and, particularly, over week ends. Most of the men would not be readily available on Saturday nights, Sundays, and holidays. As a result, there were complaints that it was almost impossible to get a veterinarian to accept a call at such times. We solved this by drawing up an alphabetical list so that at least one man was always available to accept calls, and all emergencies were referred to the man on duty for any particular week end. The police departments, dog wardens, and humane society were all advised of this arrangement, and they co-operate by referring calls to the man on duty. This was a distinct benefit to our clients and to the animals in need of services. The community is the beneficiary and no individual practitioner is the loser in this arrangement, as it all averages up over the year. During vacations, the active practitioners take care of the vacationer's calls for the duration of the vacation only. Every effort is made to turn the work over on the vacationer's return. This too, adds to the stature of the profession, as the clients realize that they are dealing with men of principle, men with moral and ethical values. The same system prevails in case of sickness of one of the members, although if he chooses to keep his hospital open, the other members pitch in and help out with office hours and surgery, and with the necessary direction of the lay personnel.

FRIENDS VERSUS COMPETITORS

All these are wonderful things. They are wonderful for the individual veterinarian, they are wonderful for his patients, and

they are wonderful for the entire community. More than that, they are an asset to the profession as a whole. But aside from these important considerations, it is the opinion of the writer that the greatest value in this arrangement is the fact that the veterinarians in this group are friends, real friends. Coming together as they do, and evaluating one another's faults and virtues, each emerges as a human being—not as a competitor or a rival. The group promotes this aspect by having a friendly get-together after each meeting where members, over refreshments presided over by the lady of the house, talk things over as friends. If one has made an ethical breach, the matter is brought up before him and before the group. It is discussed pro and con in a friendly spirit and, to date, each such matter has been satisfactorily resolved. There haven't been too many of them. Once a year, the members and their families meet for a picnic and steak roast, which helps to further the feeling of solidarity and community spirit.

It has been done in Hartford. It can be done in any community. All the equipment needed is an awareness that the other fellow is just such a human being as you, entitled to the same consideration as you would want him to extend to you. It's as simple as that, and the rewards are out of all proportion to the time and effort expended. As far as we have been able to discover, there are no drawbacks. It is the wish of the writer, and of the group, that this principle be extended over the entire country in the form of small local groups. It will be a great thing for veterinary medicine, for the animal owner, for the patient, and for you.

The members of the Greater Hartford Veterinary Medical Society are:

Drs. David Bender, Harry K. Brown, L. I. Case, D. H. Ducor, J. A. Edgett, A. N. Glassman, R. J. Gorman, Edwin Laitinen, R. Larson, G. H. Ludins, A. R. MacDonald, W. M. MacDonald, F. T. Pallotti, J. B. Stewart, H. O. Weber, R. V. Westberg.

The most common diseases of turkeys in South Australia are blackhead, cannibalism, pullorum disease, sinusitis, pendulous crop, and fowlpox.—*J. Agric. South Australia, June, 1952.*

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Permanent Intramedullary Pinning of the Femur in Dogs and Cats

R. L. LEIGHTON, V. M. D.

Springfield, Massachusetts

IN THE course of our work with intramedullary pinning, we came to believe that pins of a special alloy of stainless steel could be left in the bone indefinitely. With this in mind, we initiated in the spring of 1950 a modification of our technique, which we feel offers a useful method of treatment in suitably selected cases of fractures of the femur in dogs and cats. It is the purpose of this article to point out its indications and contraindications derived from our experience over the last two years.

Description of Method Used.—A round pin of 18-8-304 stainless steel, drill-pointed on one end and smooth-pointed on the other,

introduced up the medullary cavity of the proximal fragment until it protruded through the skin between the trochanter major and the pelvis (fig. 1). A small portion of the blunt end of the pin was left extending from the proximal fragment. This was then introduced by angulation and the use of a curved tip grooved director¹ into the medullary cavity of the distal fragment. By the use of a specially devised pin setter placed over the externally protruding point of the pin, the operator drove the pin down with a hammer (fig. 2) until resistance of the bone to the pin setter revealed that the pin itself was below the

Fig. 1—Intramedullary pin inserted up the medullary cavity of proximal fragment.



was prepared to fit the needs of the individual case. The diameter was such as to fit comfortably in the medullary cavity, and the length was determined (by measurement on the opposite leg) so that it would extend from just below the bottom of the trochanteric fossa to well into the lower portion of the distal fragment. An open reduction was performed and the pin was

bottom of the trochanteric fossa. An assistant aided, either by maintaining the bone alignment manually or by striking the blows with the hammer, while the operator held the bone with one hand and guided the pin setter with the other. A routine closure of skin and fascia was made.

It has been our procedure to place the limb in a modified Thomas splint for a few

From the Rowley Memorial Hospital, Springfield, Mass.

¹Leighton, R. L., and Keefe, F.: A New Aid in Intramedullary Pinning. J.A.V.M.A., 118, (1951):149.



Fig. 2—Pin being driven back with pin setter. It is driven down until pin is well seated below trochanteric fossa.

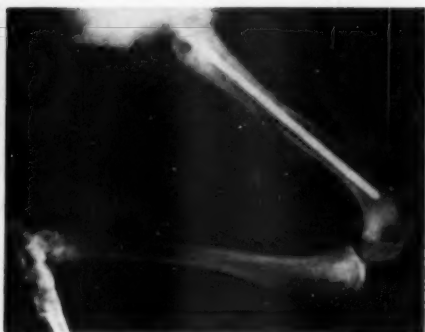


Fig. 4—Intramedullary pin permanently inserted.



Fig. 5—Second fracture of a permanently pinned femur.

Fig. 3—Midshaft fracture of the femur of a dog, which illustrates type of fracture best suited for permanent intramedullary pinning.

days. The number of days of hospitalization in those cases in which the method is useful has been materially reduced and healing usually proceeds uneventfully. No other factors affecting use of the limb are present other than those with the usual methods of treatment.

The following case histories are of a dog and a cat, with permanently pinned femurs which we have been able to observe most closely.

Case 1.—This female German Shepherd has had a most interesting history. At the age of 5½ months on April 7, 1950, she was presented with a midshaft fracture of the left femur (fig. 3) caused by having been struck by an automobile. A temporary splint was applied and treatment for shock was instituted. The intramedullary pin was inserted the next day (fig. 4). One cubic centimeter of penicillin was given daily during hospitalization which lasted nine days. The dog went home and made a good recovery, using the leg so well that on Oct. 14, 1950, it was again entered in the hospital, because it had been struck a second time by a car. Our x-ray (fig. 5) revealed that the same leg (left) had been broken but that the pin still held the fragments together. It was decided to leave the pin in and a quick recovery was made. The owners reported in January, 1952, that the dog was fine, running and playing as though nothing had ever happened to it. To look at the animal, it was not possible to determine which leg had been affected. Recently (March 2, 1952), the dog's penchant



Fig. 6—Final x-ray of permanently pinned fracture which had been fractured twice. No noticeable defect in gait.

for chasing cars resulted in her death. This afforded an opportunity to get a final x-ray (fig. 6) and to make a postmortem examination of the affected limb. Though the

Fig. 7—Multiple fracture of the left femur and fractured pelvis in a cat.



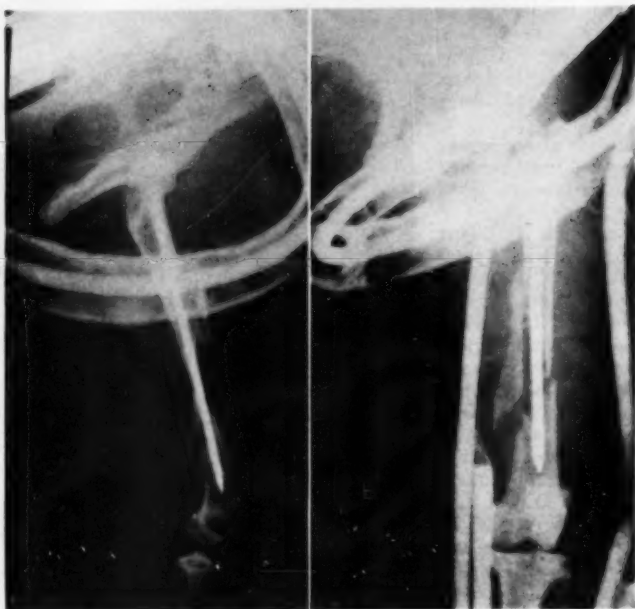


Fig. 8—Permanent pin in place in femoral fracture in a cat.

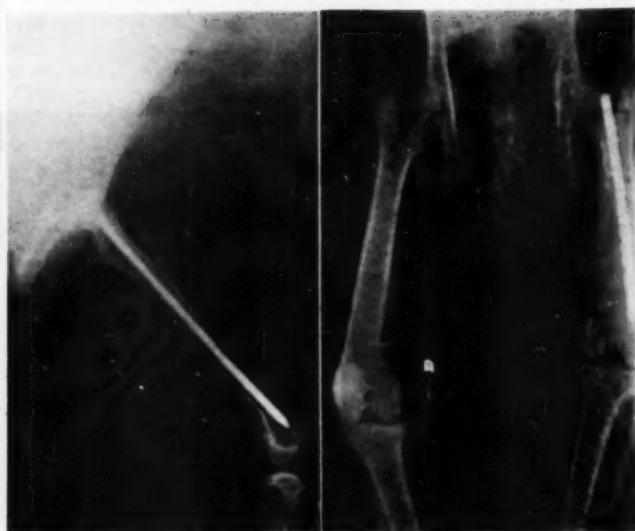


Fig. 9—Permanent intra-medullary pin in femur of a cat fourteen months later. No noticeable defect in gait.

femur was misshapen, no limitation of motion was apparent. There were some osteoarthritic changes around the lip of the femoral head. The pin itself was bright and shiny. No tissue reactions, except those associated with a healing fracture, were seen.

Case 2.—A 1-year-old male tiger cat was presented on Dec. 7, 1950, with a multiple fracture of the left femur and a fractured pelvis (fig. 7). A permanent pin was inserted the next day (fig. 8). On December 23, the cat was discharged using the leg quite well. This animal recovered completely and now no observable differences can be seen in the hind legs. A recent x-ray (fig. 9) shows the healed femur and the pin. We are continuing to observe him.

RESUME OF TREATED CASES OF FRACTURED FEMURS, APRIL, 1950, TO OCTOBER, 1951

Twenty-one cases have been treated, the majority of which were dogs. The breeds varied from small terriers to large hounds, and the ages from 3 months to 12 years. All were cases presented to our clinic and were the result, usually, of automobile accidents with all the attendant conditions of trauma, shock, and uncontrolled location of fracture sites. When discharged from the hospital, the results of pinning were considered good in 13 cases, fair in 1, and poor in 7. Of the latter, 3 had to be destroyed, 2 are still living but lame and considered poor end results, 2 others are still living with a good end result. We were fortunate enough to obtain a report last February (1952) from a majority of the owners of these animals. All those that were considered good on discharge had continued to do well.

A short discussion of our failures may be of interest. One fracture was a very proximal oblique in which the pin, not having enough support, slipped from the proximal fragment. The second was a very distal transverse fracture in which the pin slipped from the distal fragment. The third was a most severe fracture with a short proximal fragment, a short distal fragment, and the intervening portion of the diaphysis split longitudinally and fragmented anteriorly. Here, the grip of the proximal fragment on the pin was not strong enough to prevent the pin from being forced by muscle spasm dorsally back out into the trochanteric fossa and beyond. This allowed the midshaft

fragments to become badly misaligned. Healing occurred with such a marked shortening of the limb that the dog had to be destroyed. The chief reason for our failures lay in the type of fracture, with age as the only other factor. We have had no infections in this series.

CONCLUSION

In the light of our experience it would seem that this type of pinning is not suitable for very proximal oblique, very distal transverse and oblique, and severely fragmented femoral fractures. It is apparently quite satisfactory for use on transverse upper third and midshaft femoral fractures.

SUMMARY

- 1) A description of our method of introducing permanent intramedullary pinning of the femur.
- 2) Two case histories are reported, one of which is a dog with a rebreak of the same leg and bending of the pin, which subsequently came to autopsy.
- 3) A summary of our results in 21 cases is given with indications and contraindications for its use drawn therefrom.

Gonadotrophin for Ewes.—Pregnant mare's serum given to ewes on the twelfth day of the estrous cycle regularly induced multiple ovulation. The ova were highly fertilizable. The injection of 500 I.U. caused no damage but 2,000 I.U. caused lutein cysts and sometimes inhibited ovulation.—*J. Agric. Sci.*, 41, in *Vet. Bull.*, June, 1952.

Uterine Suction During Coitus

Further work is necessary, but with an ingenious tube and valve placed in the cervix of the uterus of a mare, clinicians at the University of Queensland veterinary school determined that there is a negative uterine pressure during coitus. About 80 cc. of fluid was drawn into the uterus in each of two trials. Manipulation of any pelvic organs just before service should therefore be avoided. — *Austral. Vet. J.*, May, 1952.

[If true, this should clinch the case against the old practice of "opening" mares before breeding.—ED.]

Functional Sertoli Cell Tumor with Metastasis in a Dog

DAVID L. COFFIN, V.M.D.; TODD O. MUNSON, V.M.D.; ROBERT E. SCULLY, M.D.

Boston, Massachusetts

TESTICULAR TUMORS of dogs are of interest because of their high incidence^{1,2,3} and the frequent association of one variety, the Sertoli cell tumor, with a distinctive clinical syndrome, feminization, and bilateral symmetrical alopecia.

Three main classes of neoplasms arise in the canine testis: the Leydig cell tumor, the seminoma, and the Sertoli cell tumor. Although most commonly these tumors are clinically benign, any one of them may rarely metastasize. The Leydig cell tumor (interstitial cell tumor) is the most common. Although it arises from the androgen-producing cell of the testis, it apparently never gives rise to endocrine manifestations in the dog. This is to be expected, for it occurs after puberty when the animal already possesses androgen and male secondary sex characteristics and it is known that augmentation of androgen does not produce increased maleness in normal animals.

The seminoma is derived from the spermatogenic epithelium, specifically the spermatogonia of atrophic tubules. It passes through in *in situ* (intratubular) phase before invading the interstitial tissue to form a diffuse neoplasm.⁴ It has no endocrine function.

The Sertoli cell tumor arises from the sustentacular or supporting cells of the tubules. Proof has accumulated within recent years to prove that these cells produce hormones. The outstanding evidence for this has centered about association of the Sertoli cell tumor with feminine changes in dogs. The systemic effect of this tumor was first noted because of associated hairlessness;⁵ subsequent work has elucidated the whole phenomenon. This literature has been reviewed elsewhere⁶ in a report of a series of testicular tumors occurring at the Angell Memorial Animal Hospital. In the course of this study, one

metastatic tumor with endocrine function was encountered which appeared of sufficient interest to be described in a separate case report.

CLINICAL DATA

A mongrel male Spitz, 5 years of age, was presented with the complaint of hair loss and sleepiness. The owner admitted that male dogs were perversely interested in his dog, particularly in his preputial secretion, and fought for the privilege of mounting him. No inflammatory lesions of the skin were present on this admission, although the animal had suffered from eczema the previous summer. The hair loss was peculiarly zonal and bilaterally symmetrical, involving the sides of the neck and throat and wherever the harness rubbed, as well as the posterior surfaces of both thighs. The client stated that the alopecia had first appeared under the harness, then gradually spread to the other situations. The skin in the denuded areas appeared smooth, pliable, and somewhat thinner than normal. The remaining hair was soft and fine. The nipples were enlarged and the penile sheath pendulous (fig. 1). The scrotum contained but one atrophic testis.

A firm mass, the size of a golf ball, palpable in the posterior abdomen, was interpreted as a tumorous retained testicle. A diagnosis of tumor with endocrine function of the retained testis was made and castration was recommended as a means of controlling the loss of hair and feminization. Accordingly, both the retained tumorous testis and the atrophic scrotal testis were removed (see below for pathologic study). The animal made an uneventful recovery from the operation and was discharged five days later. One month following the operation, the owner reported that hair was growing nicely in the denuded areas and that the animal was no longer annoyed by other males.

By telephone inquiry five months after the operation, it was learned that there had been a recurrence of the original symptoms four months after the operation and that

Dr. Coffin is on the staff of the Departments of Pathology, Angell Memorial Animal Hospital, Harvard Medical School, and Children's Hospital, Boston; Dr. Munson is on the staff of the Angell Memorial Animal Hospital, Boston; Dr. Scully is on the staff of the Department of Pathology, Massachusetts General Hospital, Boston.

males were again being attracted. The dog was reexamined six months after the operation. At this time, the owner stated that males were being strongly attracted



Fig. 1—Lower abdominal region showing enlarged nipples and pendulous penile sheath relating to hyperestrinism.

and that the hair was no longer growing on the areas previously denuded. It was noted that the animal was fairly well covered by hair and that hair had grown to nearly normal length over the site of the operation and the area on the forelimb clipped for venipuncture at the time of operation. No regression in the size of nipples or prepuce had occurred since the primary examination. No abnormalities were noted in the blood.

Urinalysis showed urine of chocolate color and fishy odor, containing much albumin and abundant sediment consisting of erythrocytes and neutrophils. It was hypothesized that possibly the odor of the urine was attracting the males and that cystitis rather than hyperestrinism was responsible. However, the dog was presented three months later (approximately nine months subsequent to operation) with the complaint of continued harassment by male dogs and that hair loss was again becoming evident. Frequent voiding of

dark yellow urine and difficult defecation were also reported. The animal appeared depressed but well-nourished. The hair was more abundant than on his first admission, but reduced from his last examination three months before. The areas on the forelimbs, which had been clipped for venipuncture, were particularly interesting. No further hair growth had occurred since the second admission on the left leg clipped at the time of the operation, and no growth at all had occurred on the right leg clipped at the time of the second admission. A large mass was palpable, both through the abdominal wall and rectally, in the posterior abdomen.

A diagnosis of prostate tumor was advanced with an unfavorable prognosis. The dog was destroyed at the owner's request ten months after the first admission.

PATHOLOGY

The surgical specimen was removed Jan. 9, 1950. The cryptorchid testis consisted of a firm pinkish grey nodular mass (weight 500 Gm.) with the spermatic cord emerging from one surface. The cut surface contained rather sharply defined foci of various colors and texture. There was

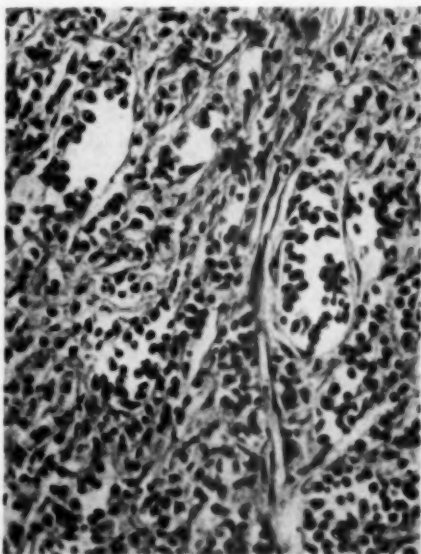


Fig. 2—Photomicrograph of primary tumor showing well-differentiated tubular adenoma type of structure present in portions of the tumor. Note the small nuclei arranged in tubules and cords on connective tissue stroma.

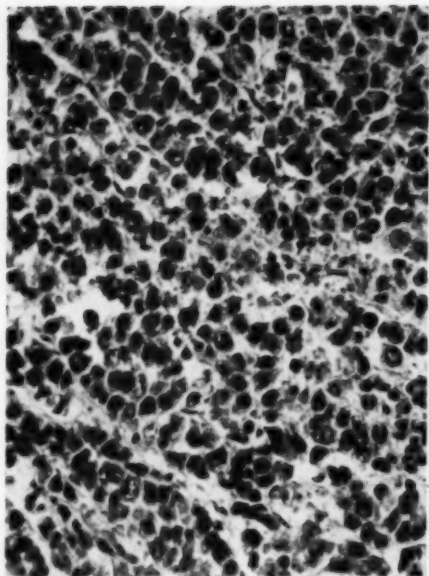


Fig. 3—Photomicrograph of primary tumor showing carcinomatous portion of tumor with undifferentiated cells with large nuclei arranged in masses and fasciculi. Note the variation in size and chromatin content of the nuclei.

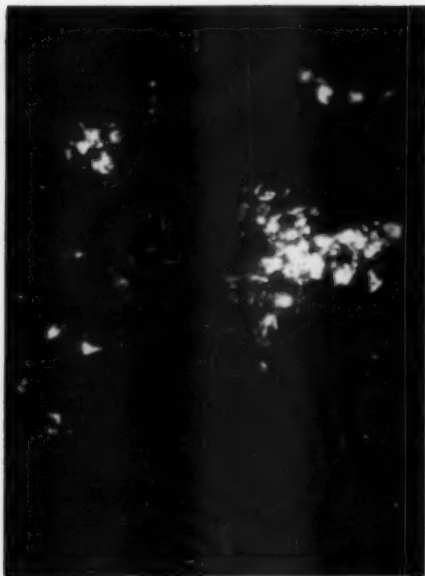


Fig. 4—Photomicrograph taken with polarized light showing doubly refractile lipoid against the black background. Note that the material occurs as clusters of granules (spherocrystals within cells).

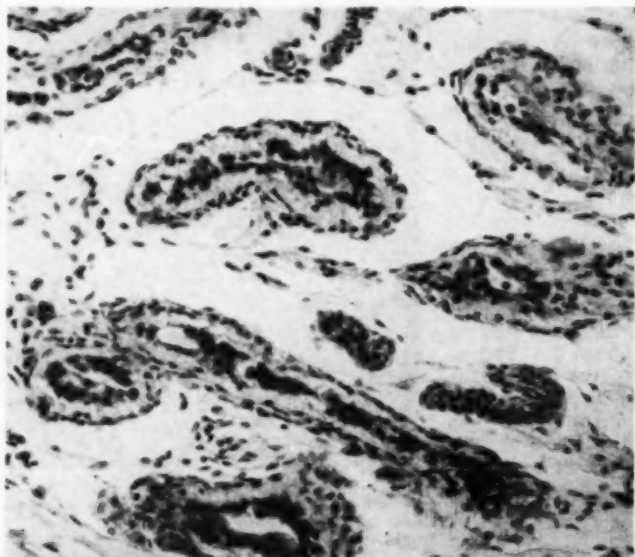


Fig. 5—Photomicrograph of the scrotal testis showing seminal atrophy from hyperestrinism. Note the complete absence of seminal cells. (It was impossible to detect even any spermatogonia in the section.) The thickened hyalinized basement membrane in the collapsed tubules lined by pigmented Sertoli cells is characteristic.

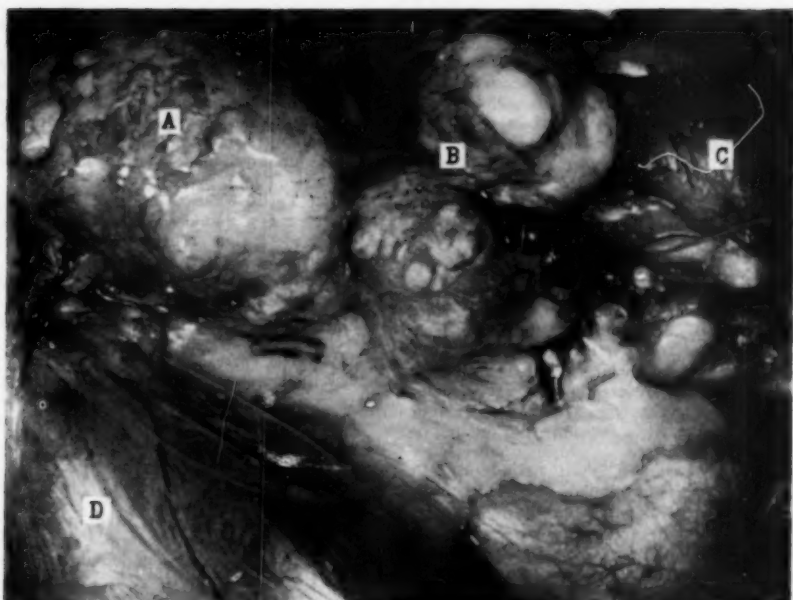


Fig. 6—Gross photograph from autopsy showing the two large tumor masses (A and B) caudal to the right kidney (C); see the dilated urinary bladder (D) for orientation.

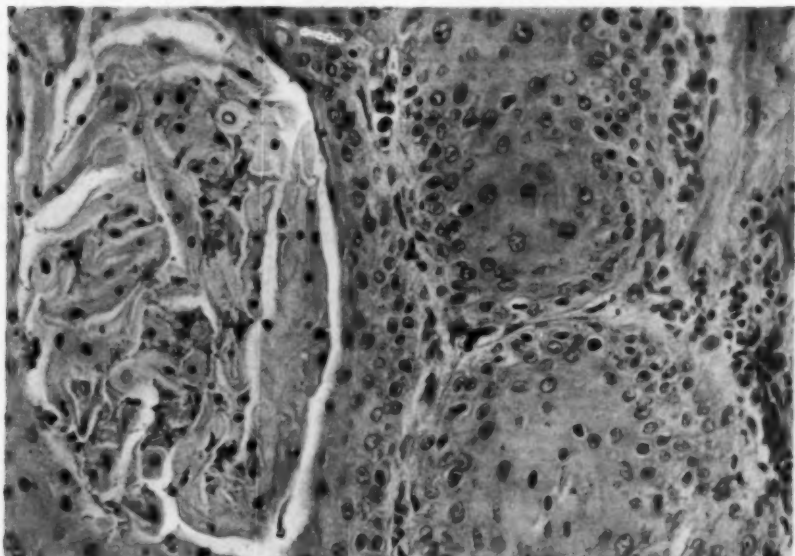


Fig. 7—Photomicrograph of prostate gland (high power) showing details of squamous metaplasia. Note complete obstruction of the acini as by a cord of epithelium and the presence of squames in another. Slight infiltration by plasma cells is evident.

firm, smooth, grey tissue, very soft grey tissue, and fairly firm pink tissue; one large area contained blood-red, friable material. The firmer portions had a slightly greasy character. The scrotal testis was reduced in size and flabby (weight 3.5 Gm.). The cut surface was olive grey and soft.

HISTOPATHOLOGY

Cryptorchid Tumorous Testis.—The microscopic picture was variable, with dense collagenous bands compartmentalizing the tumor into irregular lobules and smaller nests of cells. The tumor cells were extremely variable from place to place, both in arrangement and in character, ranging from cells with small nuclei and pale, irregular, lace-like cytoplasm (typical tubular adenoma type) (fig. 2), to cells with larger nuclei and more refractile cytoplasm containing fewer vacuoles (undifferentiated type) (fig. 3). The paler cells tended to be arranged in fasciculi, solid tubules, or in fairly large circular nests. Mitotic figures were infrequent. The largest, most basophilic cells were not arranged in tubular or pseudotubular pattern, but appeared in syncytia. Mitotic figures were abundant. Intergradation between the two types occurred. Many of the larger masses or cords of cells contained spaces in the center containing either granular precipitated protein material or blood. There were large zones within the tumor containing necrotic tissue and blood. Admixed with these areas were zones containing myxomatous-appearing edematous connective tissue containing irregular masses of tumor cells of variable size containing very large cytoplasmic

vacuoles. Large bizarre nuclei were scattered through these stromal areas.

Frozen sections stained by Sudan IV contained some fat within the cytoplasm of the more mature-appearing cells. Unstained frozen sections viewed by polarized light contained birefringent material corresponding to the lipoid seen by Sudan (fig. 4). This was presumed to be steroid hormone (estrogen).

Scrotal Testis.—The seminiferous tubules were shrunk and surrounded by a dense hyalinized basement membrane. The tubules were lined by a thin fringe of cells with small, somewhat oval nuclei with indefinite cytoplasm, many containing brown pigment (lipochrome) in the cytoplasm (fig. 5). These were presumed to be Sertoli cells. No cells resembling spermatogonia were evident. The space between the tubules was occupied by loose, rather cellular connective tissue containing a sparse admixture of cells presumed to be Leydig cells. Many of these also contained lipochrome pigment in the cytoplasm.

Gross Autopsy Description.—The external appearance was as described clinically. The nipples were large for a male, being the size of a well-developed female's. The left axillary nipple contained a small tumor. The penile sheath was relaxed. The internal examination showed the following changes: three large, firm, pinkish masses extending from the pelvis forward to the posterior portion of the right kidney (fig. 6). One of these consisted of prostate. The other two masses originated in lumbar lymph nodes. The prostate was enlarged and asymmetrical, consisting of a firm mass about 2 cm. by 3 cm. bulging from a softer mass about 5 cm. by 6 cm. The softer

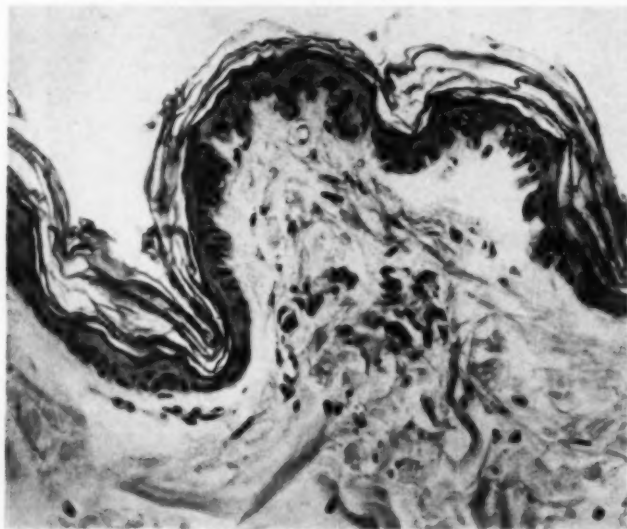


Fig. 8—Photomicrograph of the skin of the back showing reduction in over-all thickness of skin and excessive folding.

mass contained chocolate-colored fluid. The two firm masses anterior to the prostate measured approximately 5 cm. by 5 cm. by 5 cm. each. Cut sections of these tumors were dull white to pinkish red. The dull white areas had a greasy character. No other evidence of tumor was seen in the body cavity or in the pelvis (wt. of tumors, 300 Gm.).

Metastatic Mass in Sublumbar Lymph Nodes.—The mass was much more cellular than the primary tumor. That it had Sertoli cell antecedents was evident as shown by fairly differentiated tubular, adenoma-type structure in portions. However, the greater proportion of the tumor consisted of cells resembling the most primitive type in the primary tumor (see fig. 3). These portions somewhat simulated seminoma. However, careful study showed intergradation with the tubular adenoma type. Extreme anaplasia was evident with marked variation of the size of the nuclei and nucleoli. Mitotic figures were abundant. Lipoid stain (Sudan IV) revealed a scanty amount of stainable fat in sporadic distribution throughout the tumor. This appeared most abundant in the more mature cells, but was scattered through the more primitive-celled zones. This material was birefringent by polarized light and fluoresced green when viewed in the ultra violet light microscope.

The prostate showed marked epithelial keratinization, most notable in the ducts but also present to some extent in the acini. The simple columnar epithelium had changed to stratified squamous with the formation of epithelial pearls. There was excessive dilation of some ducts and acini with keratin debris (fig. 7). There was an

increase in stroma and a heavy infiltration by plasma cells was present in certain areas.

Skin.—The skin was thrown up into folds. The epithelium appeared reduced in thickness and, in most places, but two cell layers in thickness (fig. 8). Keratin was somewhat increased. The hair follicles were reduced in thickness, and no stratification into zones was apparent. The hair roots were reduced to masses of keratinized scales with no internal structure evident (fig. 9). Sebaceous glands contained no functional cells.

COMMENT

The most significant feature of the present case was the reappearance of the symptoms relating to estrogenic stimulation concomitant with the growth of the metastatic tumor. So far as we know, this is the first case in which a metastasis from a Sertoli cell carcinoma has been shown to possess the identical endocrinological function of the primary tumor.

Noteworthy also is the fact that this case closely duplicated those produced experimentally by stilbesterol administration.⁷ The regression of the symptoms following operation shows that at the time of operation the metastatic tumor was of insufficient size for estrogenic activity. Only large tumors in our series have had this effect.⁴

The clinical syndrome noted in this case, except for the relationship of the recur-

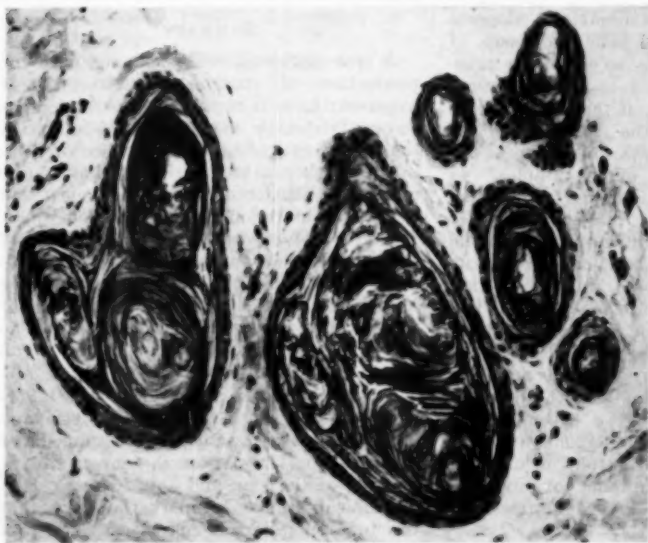


Fig. 9—Photomicrograph of group of hair follicles showing atrophy of epithelium and degeneration of the hair shafts.

rence of feminism and hairlessness to the growing metastasis, is typical of Sertoli cell carcinoma and relates to hyperestrinism. Twenty-seven additional cases of Sertoli cell tumor were observed in the course of a four-year survey.¹ Symptoms referable to endocrine function were noted in 7 other cases; all were large tumors. Of clinical importance also is the fact that eight tumors arose in cryptorchid testes and that another of these metastasized, suggesting that the tumors originating in cryptorchid testes are the most likely sources of metastasis. Of the 19 cases in which surgery was attempted, recoveries from the operation were uneventful. Regression of the endocrine symptoms following operation occurred in the 5 other dogs in which these symptoms were present.

Certain inferences of value clinically may be drawn from the foregoing. The sequence of the hairlessness appears to be as follows: (1) cessation of the hair growth due to atrophic changes in the follicles, (2) absence of normal shedding, (3) removal of the dead hairs by abrasion at the sites of bodily contact such as on the ventral surface, the sides, the lateral surfaces of the forelimbs, behind each ear, and at sites of special wear as under the harness in the present case. The hair changes were frequently noticed by clients before the signs of feminism.

While bilaterally symmetrical, alopecia in dogs is not limited solely to cases of Sertoli cell tumor. It is so commonly present that it should lead to further study for the specific changes of feminism. These are: (1) atrophy of the penis, (2) relaxation of the penile sheath and peroneal tissues, (3) hypertrophy of the nipples, (4) feminine fat distribution, and (5) sexual attractiveness to other male dogs. The presence of a large, firm mass in a scrotal testis with atrophy of the opposite organ is confirmatory. If one or both testes are absent from the scrotum, a tumorous abdominal testis should be suspected and the animal subjected to examination by means of palpation and x-ray to determine its size and location. Changes in the prostate due to estrinism are to be expected, and may consist of enlargement from squamous metaplasia and cystic dilation or of atrophy. Therefore, symptoms of dysuria, pyuria, or hematuria are sometimes encountered.

Histochemical studies of Sertoli cell tu-

mors have not been described. Therefore it is of value to discuss our findings which when correlated with the clinical evidence are conclusive of the production of estrogen by tumorous Sertoli cells. This supports similar conclusions based on chemical extraction⁶ and by experimental production of the symptoms.⁷ The evidence from the histochemical study was as follows: (a) staining of the droplets in the cytoplasm of the tumor cells by Sudan IV, demonstrating that it was composed either of triglyceride (neutral fat) or sterone; (b) greenish auto-fluorescence in similar areas under the ultraviolet light microscope, denoting that the material was unsaturated steroid; (c) birefringence when viewed by polarized light, indicating the presence of spherocrystals within the lipid droplets, characteristic of ketosteroid; (d) positive blue stain by the Ashbel-Seligman method,⁸ denoting the presence of active carbonyl groups. (This test was not performed on the present case but was positive in other similar cases.⁴) Therefore, the lipid material in the cytoplasm possesses the properties of steroid hormone, either estrogen, androgen, or cortico-sterone. Since the symptoms seen in the animal are those of feminism and are certainly not related to an excess of cortico-sterone or of androgen, the contained material is therefore estrogen.

SUMMARY

A case of Sertoli cell carcinoma with the production of changes characteristic of hyperestrinism is reported. These changes were: bilaterally symmetrical hair loss at the points of body wear, evidence of feminization as marked by elongation of the nipples, relaxation of the penile sheath, and unnatural attraction of other male dogs. These symptoms abated after removal of the offending cryptorchid testes, only to recur in six months with the developing metastatic mass. Cystic enlargement of the prostate occurred and was related to the squamous cell metaplasia of the organ due to hyperestrinism.

The pathological alterations were: Sertoli cell tumor with metastasis to the lumbar lymph nodes, squamous metaplasia of the prostate, atrophy of the scrotal testis, atrophy of the skin and hair follicles. Histochemical studies support the view that the tumorous Sertoli cell is estrogen producing.

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Effects of Stilbestrol on Swine

Contrary to its effect on some other species and to some previous reports on swine, the implantations of stilbestrol pellets in young pigs failed to increase the rate of gain or the efficiency of gain at the Florida Agricultural Experiment Station. It actually caused growth depression in young boars.

Three implants were given each pig so as to have continuous effect for about one hundred and seven days. Physical sexual changes were evident after each implantation but these disappeared in two to three weeks. Although their rate of growth was depressed, the boars manifested normal sexual behavior and later proved to be efficient breeders. Stilbestrol seemed to have no effect on the carcass of the pigs nor on the quality of their meat.—*J. Anim. Sci.*, May, 1952.

The gestation period of chinchillas is about 111 days. A young female gave birth to 1 baby when she was 160 days old. She must have been bred when 50 days old. Two males only 51 days old are reported to have impregnated females.—*Nat. Chinchilla Breed.*, June, 1952.

A Two-Phase Method of Surgical Relief of Hydrops Amnii

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The abnormal condition in a gravid cow as depicted by the term "hydrops amnii" presents a challenge in methods of surgical correction. The case reported here is one method that has terminated successfully.

History.—On April 7, 1952, a 20-month-old Hereford heifer was presented to the veterinary hospital for diagnosis and treatment. The owner had noticed an increase in the size of the abdomen during January or February and thought the condition to be bloating. He believed that an accidental breeding might have taken place in October.

The temperature was 101.8 F.; respiration and pulse were rapid; the appetite and bowel movements were normal.

A rectal examination substantiated a tentative diagnosis of hydrops amnii. The prognosis was unfavorable. The owner elected surgical correction.

Procedure.—The procedure was that of a two-phase sequence of surgery. The first phase was to establish continuous slow drainage for splanchnic conditioning with gradual pressure release. The second phase was to be the surgical abortion of the fetus.

The drainage procedure was accomplished the day of admission in the following manner: With the complete left flank properly prepared, a local infiltration and caudal block were made, using cyclaine hydrochloride, 1 per cent.

The skin, muscular layers, and peritoneum were incised to make a 4-in. orifice located antero-dorsally in the paralumbar fossa. The gloved hand of the surgeon, containing a "palmed" 5/32-in. horse trocar, was passed into the peritoneal cavity. The trocar was passed through the abdominal wall, tunic, and skin from inside outward near the anterior edge of the fold of the flank. The matching cannula was placed over the trocar and forced into position from the outside inward. The trocar was withdrawn and discarded. A plastic tube from a venopak was introduced into the incision and attached to the internal end of the cannula by slipping over the end of the

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cannula. The plastic tube, serving as the drainage canal, was drawn to the exterior.

A hub adapter was attached to the free end of the tubing and a 12-gauge needle, 5 in. long with a blunted point and a hole ground in the side near the end, was attached. The needle was then driven into the distended uterus in its ventral third. A gut suture in the uterine wall lashed the needle hub to hold it in place.

The tubing was aligned within the peritoneal cavity to insure continuous drainage and the incision was closed.

Twenty-four hours later, the animal's condition appeared favorable enough to continue with the second phase—an orthodox left flank cesarean section. As in the draining procedure, this surgery was accomplished with the animal in the standing position. The left flank was again prepared and a local infiltration block was administered using 1 per cent cyclaine hydrochloride.

The first incision was extended and the uterus presented to the exterior. The drain was removed and discarded. The uterus was incised on the greater curvature; the fetus was removed and maternal tissues examined for abnormalities. The cervix was found to be so tightly closed that a catheter could not be admitted through the natural opening. The amnion was close to the fetal body and the pathological collection of fluids was of the allantois. The remaining fetal fluids were not drained from the open uterus but were retained for added bulk.

Four, 500-mg. aureomycin oblets were introduced into the uterus and 1.5 ml. of posterior pituitary extract was given intravenously. The uterus was closed and 200 ml. of merameth was placed in the peritoneal cavity. The abdominal wound was closed. Sulfanilamide was placed in and about the incised area. One and a half million units of penicillin was given intramuscularly. Five milligrams of estradiol cyclopentylpropionate (E.C.P.) was given intramuscularly to dilate the cervix.

Postoperative Care.—On the second day, a metal cow catheter was introduced into the cervix and lashed by a suture to the lateral wall of the vulva. Cervical dilation was incomplete seventy-two hours after the abortion; therefore, another 5 mg. of estradiol cyclopentylpropionate was given intramuscularly. Ninety-six hours after completion of surgery, the placental structures

were removed manually. At this time, 1.5 Gm. of aureomycin was placed in the uterus and 2.5 Gm. of aureomycin was given intravenously.

The day following removal of the placenta, the temperature rose to 104 F., and 100 mg. of aureomycin was given. Twenty-four hours later, the temperature was 103 F., and 2 Gm. of streptomycin was given. Eight days after admission, the temperature was normal and the animal was pastured. On the eighteenth day, she was discharged.

Pathological Examination of Tissues.—At surgery, the maternal tissues were noted to be mildly edematous. The abnormal collection of fluids was allantoic rather than amniotic. The fetus lived five minutes after surgical removal.

The fetal tissues were heavy with the transudate; the kidneys were water-logged and pale in appearance. Microscopic studies were not made.

Discussion.—In the adoption of a two-phase plan of surgery for the relief of uterine hydrops, the cardinal principle is the gradual release of splanchnic pressure to prevent the shock syndrome by mechanical drainage. As in this case, antibiotics may be indicated in animals of reduced vitality. Hormonal therapy may be indicated when it is desirable to hasten the physiological processes coincident to completion of a normal gravid cycle.

SUMMARY

A method of surgical correction of hydrops amnii and allantois is given in which a two-phase procedure is used, one of drainage and the second of surgical abortion.

The case described here is one of hydrops allantois rather than that of hydrops amnii.

It is reported that dystocia due to partial dilatation of the cervix in the ewe may be overcome in twenty to forty-five minutes by inducing epidural anesthesia.—*Vet. Rec.*, April 5, 1952.

Fertilizing Capacity of Spermatozoa.—Experiments with rabbits revealed that spermatozoa must remain in the female reproductive tract for several hours before they are capable of fertilization. Thus, local incompatibility may explain many cases of sterility.—*Vet. Bull.*, June, 1952.

Cervical Disc Protrusions in the Dog

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AS EARLY AS 1858, the anatomist, von Luschka, described protrusions of the intervertebral disc in man, but not until the late 1920's was the clinical importance of this condition recognized in human medicine.

In veterinary medicine, however, Dexler as early as 1896 reported a disease in the dog, the symptoms of which were posterior paresis or paralysis caused by compression of the spinal cord and/or the nerve roots. The encroachment on the space in the vertebral canal was, according to Dexler, the result of regressive changes in the discs and hyperplastic processes on the dorsal side of the discs. Secondary to these changes there was, still according to Dexler, an inflammatory reaction in the vertebral periosteum, epidural space, and dura. Ever since Dexler's work, the disease has been known under the name of "enchondrosis intervertebralis."

Joest (1921) and Wiedemann (1922) also observed primary regressive changes in the inner part of the disc and interpreted the formations in the epidural space as the result of a cartilage growth from the disc perichondrium.

In human medicine, there were until 1918 (Steinke) only a few reports of so-called extradural ventral chondromas or enchondromas but during the following ten years, these formations were recognized as a more common cause of spinal cord compression. In the late 1920's Schmorl drew attention to the occurrence and frequency of nuclear protrusions of the discs in man, and soon the true nature of the extradural ventral chondromas were revealed, *viz.*, protruded disc material.

Contributions to this knowledge were supplied especially by the work of Alajouanine and Petit-Dutaillis (1930), Elsberg (1931), and Mixter and Barr (1934). The last-mentioned authors stated that disc protrusion was a common cause of sciatica.

In 1939, Tillmanns showed that the formations described by Dexler could be protruded disc material, and in 1948 Fankhauser reported identical observations in his works. Independent of the European conclusions, Riser (1946) stated that disc protrusions in dogs was a common cause of posterior paralysis.

Supported by statistical analysis, Hansen in 1951 claimed that three breeds of dogs were more disposed to disc protrusion than others; *viz.*, French Bulldog, Dachshund, and Pekingese. Certain signs of chondrodystrophia are common to

these breeds and a characteristic of this group of dogs is a rapid chondroid transformation of the disc center. The normal elasticity of the disc, therefore, disappears and degenerative processes are found earlier than in other breeds of dogs.

Disc protrusion presupposes disc degeneration, and disc degeneration is a definite systemic disease in dogs. Protrusions into the vertebral canal are, however, not to be found in the nine most cranial thoracic discs in the dog due to the existence of a ligamentum conjugale costarum.

Through roentgenological, clinical, and pathological-anatomical studies, Olsson showed that the symptoms caused by a protruded disc depend upon its localization and the manner in which it protrudes. A sudden protrusion gives rise to severe symptoms, sometimes even to spinal shock with lethal effect. The duration of the symptoms seem to depend mainly upon irritation on the spinal cord caused by altered pressure in the protruded disc following movements of the spine. The size of the protrusion seems, strangely enough, to be of less importance to the symptoms in many cases. Natural healing is considered to depend mainly upon elimination of the above-mentioned dynamic factor as well as on the great adaptiveness of the spinal cord.

A method of operation called fenestration has been introduced which aims at eliminating the dynamic factor, thus supporting natural healing. (In this case the fenestration would involve a hole outside the spinal canal in the annulus fibrosus as far as the nucleus pulposus.)

In the dog, thoracolumbar disc protrusions are most common and their symptoms are so well known that they need not be mentioned here. Cervical disc protrusions also are frequently found at autopsy, and their existence is known to some authors (Riser, Frankhauser), but their clinical consequences have, according to available literature, not been described. The only exception seems to be one case reported by Olsson.

In man, lumbar disc protrusions seem to be more common than cervical disc protrusions. According to Browder and Watson, reports of 4,000 cases of lumbar disc protrusions had been published by 1945, and the corresponding figure for verified cases of cervical disc protrusions was 69, only a small proportion of which had symptoms of medullary lesions. This figure for cervical protrusions has, however, increased since the diagnostic procedure in these cases has been improved.

Stookey was the first to give a clear description of the symptomatology of cervical disc protrusion in man. In 1928, he published reports of seven cases. He found three different clinical syndromes.

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The syndromes depend on the position of the protrusion in the spinal canal. Protrusions causing a bilateral compression of the spinal cord give symmetrical symptoms usually from all four extremities. In cases of more severe compression, there are signs of transverse lesions. Local symptoms from the neck, such as pain and decreased mobility, are usually absent in these cases. The second syndrome is caused by relatively small protrusions, situated somewhat lateral to the midline, and consists of symptoms from the homolateral arm, pain radiating down the neck, paresis, and muscular atrophy. The third syndrome presupposes a more laterally situated protrusion which compresses a root without involving the cervical cord. The symptoms are local muscle atrophy and hypotonia limited to the distribution of the roots involved. The sensory signs are purely subjective.

Further contributions to our knowledge of cervical disc protrusion in man and its symptomatology and treatment have been given by Stookey, Bradford and Spurling, Kristoff and Odom, Semmes, Bucy, Heimburger, and Oberhill, Brain, Müller, and others.

Müller called attention to the fact that cervical disc protrusions have a greater tendency to calcification and ossification than lumbar protrusions. They also are more likely to be accompanied by spur formations on the surrounding vertebrae. Studies on disc protrusions in the dog carried out since 1949 at the Royal Veterinary College in Stockholm have proved cervical disc protrusions to be more common than has been believed. This paper is intended to be a contribution to the knowledge of cervical disc protrusion in the dog as a clinical entity.

MATERIAL

Forty-three dogs with disc protrusions were used in this study. Of these dogs, the authors had the opportunity of performing autopsies on 21. In 4 of these the diagnosis had been ascertained *intra vitam* with the aid of thorotrast myelography. Eighteen of the dogs had been examined at the pathologico-anatomical department from 1925 to 1946. The remaining 4 cases had been diagnosed with the aid of myelography only. Of the above-mentioned 43 cases, the authors had the opportunity of clinically examining 8 cases.

PATHOLOGICO-ANATOMICAL OBSERVATIONS

The pathologico-anatomical material comprised 39 dogs classified according to breed, sex, and age (see tables 1 and 2). This distribution does not deviate from that of disc protrusions on the whole. Here, too, the chondrodystrophoid breeds — Dachshund, French Bulldog, Pekingese — were more susceptible to the disease.

From the study of disc protrusions in the dog, it is well known that they appear in two types. Type 1 is characterized by

larger protrusions, irregular form, brittle, granular consistency, and greyish yellow to greyish red color. Type 2 shows smaller protrusions, regular form, even and smooth surface, and comparatively firm consistency. The main difference between these two types is that type 1 is caused by a total annulus fibrosus rupture, while type 2 may be traced to a partial rupture. The former type appears mainly in chondrodystrophoid dogs and the latter in old dogs of all breeds. The symptoms are more grave and acute in the former type.

This classification also holds good for cervical protrusions. Protrusions of type 1 occur in the chondrodystrophoid breeds mentioned as well as in Dachsbraches and Spaniels. The development of the discs in these dogs is closely related to that of the chondrodystrophoid dogs.

The distribution of the 63 cervical protrusions in 39 dogs is shown in tables 1 and 2.

It may be noted that the difference between disc C 7—Th1 and C 2—C 3 is significant. There is very likely a difference also between the former and the discs C 5—C 6, and C 6—C 7.

The systemic spread of the disc degeneration is also illustrated by the circumstance that most dogs with cervical protrusions also have thoracolumbar protrusions. Table 1 thus shows only 4 cases in which changes are localized only in the cervical region. Table 2, in which the data are taken from records, has a higher percentage of cases with only cervical protrusions. This material comprises, however, cases in which only the cervical region has been examined. Examination of the cervical portion of the spine has evidently been carried out because compression of the cervical cord has been suspected. This also explains why this material shows a greater percentage of cases with symptoms caused by cervical protrusions.

Table 1, based on routine examinations, is probably more representative of the relation between cervical and thoracolumbar protrusions. Further, the relation between clinically important findings and cervical protrusions noticed as secondary findings is seen better here than in table 2.

Disc protrusions of type 2 have been recognized as phenomena in spondylosis deformans. According to our observations, the simultaneous occurrence of these two

conditions is not common. Concerning the cervical region, spondylosis is rare in dogs, and only in solitary cases is a cervical protrusion situated in a disc surrounded by spur formations. As is mentioned above, such a relation has been reported in human medicine.

Disc protrusions are, as we know, one of the ways in which disc degeneration occurs. The typical changes during aging and other expressions of disc degeneration are on the whole similar concerning the cervical region and other parts of the spine. Nevertheless, the relative frequency of protrusions as well as calcifications is less here than in the thoracolumbar portion of the spine.

CLINICAL OBSERVATIONS

As is mentioned, we had the opportunity to examine and follow, clinically, 8 cases of cervical disc protrusion in the dog. A detailed report of these cases may serve as a background for further discussion of the condition.

Case 1 (K.F.4/51).—A 7-year-old male Dachsbrache had had for three days difficulty in walking down stairs. On level ground, the dog had no trouble walking but had kept its back arched. When admitted to the clinic the dog's condition had grown worse.

Status on Arrival.—The dog was apathetic, would not lie down but stood up stretching its head forward. Its neck was stiff and its back arched. A slight tonic cramp was noticed in the hind legs and tail. Further, the dog's gait was stiff. The movements of the right front leg were almost normal, but in the left leg there seemed

to be a paresis of the muscles supplied by the nervus radialis. The dog's condition did not allow a thorough neurological examination. The reflexes seemed, however, to be normal and no skin hyperalgesia could be clearly established. The dog moaned from time to time, especially when one tried to bend its neck.

Roentgen Examination.—Ordinary roentgenograms of the cervical portion of the spine showed narrowing of the spaces between C 3—C 4 and between C 5—C 6. The thickness of these discs seemed to be half that of normal discs. Furthermore, disc C 4—C 5 was calcified. Myelography gave the following results: The contrast medium showed a small protrusion of disc C 3—C 4 and stopped just cranially to disc C 4—C 5.

Diagnosis.—Compression of the cervical spinal cord was caused by at least two, perhaps three, disc protrusions (C 3—C 4, C 4—C 5, C 5—C 6).

Course.—The dog was killed after the myelographic examination.

Autopsy Findings (0.77/51).—In the vertebral canal on the left side along the whole C 5 there was a fairly soft, dark red, greyish formation about 3 mm. wide. A corresponding compression of the spinal cord was seen. Disc C 4—C 5 had a transverse rupture 3 mm. wide near C 5, but the formation consisted of protruded nuclear material from disc C 5—C 6 which had a total transverse rupture in its caudal part (fig. 1). Disc C 4—C 5 had another protrusion 2 to 3 mm. high with a rough dorsal surface. Besides this, disc C 3—C 4 showed a dorsal bulge about 2 mm. high.

Histological Examination.—The spinal cord showed at the level of C 5 the picture of compression myelitis with marked demyelination, slight vascularization, and small perivascular infiltrations of mononuclear cells.

Case 2 (K.508/51).—A 10-year-old male Dachs-hund had slight posterior paresis and lameness in

TABLE 1—Cervical Disc Protrusions in 21 Dogs (Autopsy Material from 1948 to 1952)

Autopsy No.	Breed	Years of age	Sex	Protrusions of						No. of thoracolumbar protrusions	Symptoms caused by the cervical protrusions
				C2/C3	C3/C4	C4/C5	C5/C6	C6/C7	C7/Th1		
642/48	Dachshund	14	♀			+	+	+		0	No anamnesis.
327/49	Dachshund	7	♀	+	+					2	Pain in the neck.
746/49	Fr. Bulldog	?	♀	+	+	+		+	+	3	No anamnesis.
815/49	Dachshund	13	♀	+	+		+			1	None.
104/50	Cock. Span.	12	♂	+	+	+				5	None.
554/50	Chow	8	♂	+	+					2	Similar to those of dogs with disturbances in the equilibrium.
679/50	Dachshund	4	♂				+			0	None.
281/50	Dachshund	9	♂					+		2	None.
102/50	Poodle	8	♂					+		1	None.
682/50	Dachshund	12	♀					+		1	None.
852/50	Dachshund	5	♀					+		2	None.
159/50	Spitz	6	♂						+	1	None.
752/50	Alsatian	11	♂						+	2	None.
77/51	Dachshbrache	7	♂		+	+	+			0	See case reports (No. 1).
129/51	Dachshund	5	♂				+			2	None.
346/51	Dachshund	8	♂						+	5	None.
400/51	Dachshund	10	♀			+	+	+		2	None.
439/51	Fr. Bulldog	9	♀				+	+		4	None.
637/51	Dachshund	10	♂			+	+	+		3	See case reports (No. 2).
668/51	Dachshund	7	♂	+						0	See case reports (No. 3).
784/51	Dachshund	6	♀	+						1	See case reports (No. 4).

the left front leg. Further, it seemed to have suffered severe pain. Similar symptoms had been noticed some years earlier.

Status on Arrival.—The dog was lying on its right side and was in bad condition. It could not stand on its legs or walk. A marked atoni and hyporeflexia in the left legs could be noticed. The dog cried sometimes spontaneously but especially when touched.

Roentgen Examination.—An ordinary roentgenogram showed a diminished space between C 4 — C 5. Myelography showed a contrast block at the level of disc C 4 — C 5.

Diagnosis.—The diagnosis was compression of the cervical spinal cord caused by a protrusion of disc C 4 — C 5.

Course.—The dog was treated with vitamin B₁₂ and improved slightly. Seven days after admission, it could walk but showed disturbances of equilibrium and the pain persisted. On the owner's request, euthanasia was performed ten days after admission.

Autopsy Findings (0.65F/51).—Disc C 4 — C 5 had a median protrusion 7 mm. long, 5 mm. wide, and 3 mm. high (fig. 2). The protrusion was rather firm in consistency, its color was greyish red, and it had a fibrinous adhesion on the dura. There was a spinal cord compression corresponding to the protrusion. On the left side of disc C 5—C 6, there was a protrusion 4 by 3 by 3 mm. in size. On disc C 6—C 7 was a small bilateral protrusion. Similar small protrusions, probably of no clinical importance, could also be found on discs Th 9—Th 10, L 1—L 2, and L 2—L 3.

Histological Examination.—The spinal cord showed, at the level of disc C 4—C 5, moderate compression combined with a pronounced demyelination but with no signs of inflammatory reactions.

Case 3 (M.6F0/51).—A 7-year-old male Dachshund had previously been healthy, but three weeks before admission it had become unwilling to walk up and down stairs and its back had become arched. The dog cried as soon as its neck was touched.

After four or five days, first the left front leg and then the left hind leg became paretic, and the neck rigid. The dog could neither eat nor drink. However, some improvement was noticed shortly before admission.

Status on Arrival.—The dog could not rise to a standing position. When helped up, it could stand for a few seconds but after a couple of steps it would fall over. Its back was kyphotic and bent to the right. There was a marked paresis in the muscles supplied by the left nervus radialis. The dog moved his head carefully. The skin sensibility and reflexes seemed to be almost normal. The dog preferred to lie on its right side.

Roentgen Examination.—An ordinary roentgenogram showed that the central part of disc C 2—C 3 was calcified. The calcium content allowed the nucleus pulposus tissue to be visualized even in a dorsal rupture of the annulus fibrosus and in a large protrusion.

Myelography showed total blockage at the level of the above-mentioned protrusion.

Diagnosis.—The diagnosis was compression of the spinal cord by a protruded disc (C 2—C 3).

TABLE 2—Cervical Disc Protrusions in 18 dogs (Autopsy Material from 1925 to 1946)

Autopsy No.	Breed	Years of age	Sex	Protrusions of							No. of thoracolumbar cervical protrusions	Symptoms caused by the
				C2/C3	C3/C4	C4/C5	C5/C6	C6/C7	C7/Th1			
89/23	Fr. Bulldog	9	♂	+							—	None.
212/29	Fr. Bulldog	4.5	♂		+						—	Pain, paresis of the right front leg.
429/36	Alsatian	7	♂					+			—	Pain, paresis of the left front leg.
95/38	Boxer	8	♀			+					—	Pain in the neck, paresis of the front legs.
546/38	Dachshund	7	♀	+							1	None.
376/39	Pekingese	3	♂	+							—	Pain and rigid muscles in the neck, opisthotonos, paresis of all the legs.
205/40	Harrier	10	♀				+				—	Pain in the neck.
61/41	Rottweiler	8	♂			+	+				—	Total paralysis.
516/41	Fr. Bulldog	4	♀				+	+			5	None (from only the thoracolumbar protrusions).
45/43	Rottweiler	7	♀	+							—	Pain.
585/43	Dachshund	10	♀				+	+			3	None (from only the thoracolumbar protrusions).
605/45	Cock. Span.	9	♂	+	+	+	+				—	Pain and rigidity in the neck, paresis of the right front leg.
122/45	Eng. Bulldog	7	♀	+							—	None.
132/45	Dachshund	9	♂		+				+		—	None.
180/45	Alsatian	10	♂	+							1	None (from only the thoracolumbar protrusions).
188/45	Pekingese	7	♀						+		2	None.
721/45	Dachshund	7	♂	+							1	Pain, paresis of all the legs.
794/45	Dachshund	6.5	♀		+						1	None (from only the thoracolumbar protrusions).

Course.—The dog's condition grew worse after nembutal anesthesia, and it never regained consciousness. It died three days after admission to the clinic.



Fig. 1—Case 1. Sagittal section showing discs C 5—C 6 (to the left) and C 6—C 7. The former shows a total rupture of the dorsal part of the annulus fibrosus close to C 6. The ruptured disc is the site of a marked hemorrhagic infiltration. Disc C 6—C 7 has a small rupture of the outermost annular lamellae close to C 7.

Autopsy Findings (O.668/51).—Disc C 2—C 3 had protruded. The protrusion, 10 by 7 by 5 mm. in size, was situated just to the left of the median plane (fig. 3). It was white, granular, brittle, and adhered fibrinously to the dura mater. There was a corresponding compression of the spinal cord.

Case 4 (K.F04/51).—A 6-year-old male Dachshund was admitted with a diffuse anamnesis. Two hours before arrival at the clinic, the dog suddenly had cried out with pain without any noticeable reason. When touched, especially on the head or neck, it had cried for several minutes.

Status on Arrival.—The dog was well nourished and nothing abnormal could be found on clinical examination. The dog was sent home but was returned three days later. The symptoms were still the same. However, just before arrival at the clinic, the dog had vomited. This time the dog showed slight tenderness when its neck was bent and palpation over the cervical muscles seemed to be painful. There was, however, no rigidity in these muscles and the reflexes were normal.

Roentgen Examination.—An ordinary roentgenogram of the spine showed several calcified discs. One of them was C 2—C 3.

Myelography.—The contour of the spinal cord showed a slight impression just over disc C 2—C 3 indicating a small disc protrusion.

Diagnosis.—The condition was diagnosed as compression of the spinal cord by a protrusion of disc C 2—C 3.

Course.—The dog did not show normal reaction under and after myelography. It got cramps and did not return to consciousness but died forty-eight hours later.

Autopsy Findings (O.F84/51).—On disc C 2—C 3 close to C 3 and to the left was a firm white protrusion $\frac{1}{2}$ by 3 by 4 mm. in size. It filled a great part of the adjacent foramen intervertebral, thus compressing the third left nerve root

which seemed to be swollen (fig. 4). The compression of the spinal cord was slight. On disc L 7—S 1, there was a bulge 3 by 2 by 2 mm. in size without any compression of the cauda equina.

With the exception of the disc protrusion, the sectional picture was similar to that of thallium poisoning. A chemical analysis proved that the dog really had been poisoned by thallium. This circumstance may explain the vomiting reported in the anamnesis.

Histological Examination.—A section from the third cervical nerve on the left side, including part of the ganglion, showed the following: Chronic neuritis resulting from spreading degenerative changes of the nerve fibers; increased amount of collagen; and infiltration of lymphocytes and other mononuclear cells. The corresponding right nerve seemed to be normal.

Case 5 (M 141/51).—A 6-year-old female Dachshund, about one month prior to admission to the clinic, had had a violent attack of pain. After that it had not been able to move as usual. It had manifested tender abdominal muscles and had kept its back arched. Although it had been treated with vitamin B₁₂, it had gradually become worse.

Status on Arrival.—The dog was thin and apathetic. It was unwilling to lie down and would stand with its back arched and its neck stretched. It moved stiffly and seemed to suffer from pain when touched. There was no clear localization of the pain. When lying down, it would lie flat on its side. On account of pain, no examination of reflexes could be made.



Fig. 2—Case 2. Dorsal view of a part of the cervical region with the vertebral arches and the spinal cord removed. Disc C 4—C 5 (to the right) shows a large median protrusion and disc C 5—C 6 a smaller lateral one.

Roentgen Examination.—Ordinary roentgenograms showed many calcified discs, among others discs C 2—C 3, C 3—C 4, C 5—C 6.

Course.—The dog's condition gradually grew worse in spite of intensive treatment with vitamin

B₁₂ and unwilling to walk. During the last ten days, it had shown diffusely spread tenderness of the body and had cried out with pain when touched. The tenderness had, however, been localized mainly in the forepart of the body. With



Fig. 3—Case 3. Sagittal section showing discs C 2—C 3 (to the right) and C 3—C 4. The former has a calcified nucleus extending in a dorsal direction through an annulus rupture. Thus, on the dorsal side of the disc a protrusion is seen, showing a cut surface identical to that of the calcified disc center and in direct communication with it.

B₁₂, rest, and heat. It began to show poor balance and ataxia. Further, evident radial paresis of the right front leg could be noticed. In addition, the dog developed pneumonia but recovered after treatment with aureomycin. When it was re-admitted to the roentgen department for myelography, after having been at the clinic for four weeks, the status was as follows: It would lie on its side and moan. When placed upright, it would take a few wobbling steps and then fall over. Extensor paresis of the right front leg was evident. The head and neck were bent somewhat to the right. A purulent rhinitis and conjunctivitis were present.

Myelography.—There was a total block at disc C 2—C 3. The contour of the spinal cord could be seen clearly as far as this disc where the contrast lines were pressed against each other and were elevated toward the vertebral arch exactly over the disc.

Diagnosis.—The condition was diagnosed as compression of the cervical spinal cord caused by protrusion of disc C 2—C 3.

Operation and Results.—Four days after myelography, disc C 2—C 3 was fenestrated from the ventral side. The next day, the dog seemed relieved of pain. In spite of the wound from the operation, the animal could move its head and neck. Improvement continued and after a week the dog was able to climb up into its cage, and the radial paresis was gone. After four weeks, the dog had completely recovered. Six months later, the owner reported that the dog still was in perfect condition.

Case 6 (M.252/51).—A 6-year-old male Dachs-hund was submitted with the following history. Two months before admission the dog had seemed

the exception of these symptoms, the dog had seemed normal. According to the owner, it had been able to walk normally during this period.

Status on Arrival.—The dog was in good condition. It moved, however, very carefully and slowly and the mobility of the head seemed to be diminished. For example, the dog would not raise its head to look up. Tenderness was noticed when an attempt was made to bend its neck. Otherwise, sensibility and reflexes seemed to be normal.

Roentgen Examination.—Ordinary roentgenograms showed calcification of many discs and a somewhat calcified protrusion of disc C 2—C 3.

Myelography.—The spinal cord visualized by the thorotrast in the subarachnoid space was pressed against the roof of the vertebral canal by the above-mentioned disc protrusion but there was no total block. Otherwise, the myelogram showed nothing abnormal.

Diagnosis.—The diagnosis was spinal cord compression by a protrusion of disc C 2—C 3.

Course.—An operation was performed five days after myelography. Disc C 2—C 3 was fenestrated from the ventral side. The day after the operation, the dog could move its head better than before. Six days later, the dog left the clinic. It moved normally but still had some pain at passive movements of the head. This disappeared after another week. Half a year later, the dog was still in excellent health.

Case 7 (M. 819/51).—Two years before admittance, this dog had had posterior paralysis. It had been almost cured after long conservative treatment (rest and vitamin B₁₂). During last summer, the owner noticed that the dog seemed to suffer from headaches. Three days before the dog was

submitted to the clinic, it had suddenly cried and had then refused to move its head.

Status on Arrival.—The dog walked without difficulty but kept its back arched. Palpation and passive movements of its head and neck seemed to cause considerable pain. The reflexes appeared normal. A cervical disc protrusion was suspected. The owner preferred conservative treatment. In spite of three weeks' treatment with vitamin B₁₂ and rest, the dog showed no improvement. It cried with pain almost every night. When readmitted to the clinic, the dog showed the same symptoms as before, only more pronounced.

Roentgen Examination.—Ordinary roentgenograms of the cervical spine showed that the first two discs (C 2—C 3, C 3—C 4) were calcified, as was disc C 4—C 5 but this one was also narrower than normal.

Myelography.—Myelography showed total blockage at the level of disc C 4—C 5.

Diagnosis.—The diagnosis was compression of the spinal cord caused by a disc protrusion (C 4—C 5).

Course.—An operation, performed six days after the myelography, consisted of fenestration from the ventral side of the discs C 2—C 3, C 3—C 4, and C 4—C 5.

A marked improvement was noticed two days after the surgical intervention. After a week, the dog had completely recovered. Two months later, the owner claimed that the dog had regained a vitality not seen for half a year and that the symptoms had totally disappeared.

Case 8 (M.926/51).—A male Cocker Spaniel, 8 years old, was submitted with the following history. On a walk four days before admission, the dog had suddenly stopped and cried. After that, it had been unwilling to move and had shown tenderness in the neck.

Status on Arrival.—The dog was well nourished and in good condition, but moved its head very carefully. The cervical muscles were extremely rigid and palpation on the neck seemed to be painful. Otherwise, mobility, sensibility, and reflexes were intact.

Roentgen Examination.—Ordinary roentgenograms of the cervical spine showed a narrowed disc (C 2—C 3). In this disc there was further a calcified content which protruded partly into the spinal canal.

Myelography.—At the level of the first disc was a spinal cord compression but no total blockage. Otherwise, no changes were visible.

Diagnosis.—The condition was diagnosed as spinal cord compression caused by a protrusion of disc C 2—C 3.

Course.—Fenestration of disc C 2—C 3 and C 3—C 4 was performed three days after myelography. Two days after the operation, the dog left the clinic improved. About ten days after the surgical intervention, the dog had recovered completely. The owner now realized that the dog had very likely suffered from pain for half a year, as symptoms, which he had previously considered signs of age, had disappeared after the operation.

DIAGNOSIS

Besides the 8 cases reported above, 10 of the autopsy cases had, according to the anamnesis records, shown symptoms probably caused by compression of the cervical spinal cord and/or the cervical nerve roots. With the guidance of these 18 cases, the following observations are made.

In all cases except one, intense pain was noticed. The localization of the pain was usually in the neck but sometimes even the chest and the front legs were involved. This probably indicates that cord compression in the dog is, as a rule, accompanied by compression of the nerve roots. As we have seen, dog 4 had a large root compression (C 3) and only a slight compression of the cord. In that case, pain in the neck was the only visible nervous symptom. Only this case and the one (0 61/41) with total paralysis could possibly be fitted into any of the three syndromes found by Stookey in cervical disc protrusions in man. All the others seemed to have had either a unilateral or a bilateral compression of the cervical spinal cord combined with a nerve root compression.

Motor disturbances may occur in all four extremities, in the legs of one side, the front legs, or in any one leg.

Paresis in a majority of the body muscles occasionally complicates the clinical picture. In advanced cases, examination of reflexes is difficult and not absolutely reliable. Lack

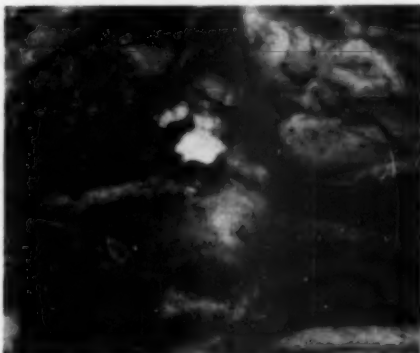


Fig. 4.—Case 4. Dorsal view of a part of the cervical region with the vertebral arches and the spinal cord removed. Disc C 2—C 3 shows a lateral, rather small, calcified protrusion (white in color). It is situated primarily in the foramen intervertebrale, causing a deviation of the spinal nerve. The latter is seen immediately lateral to the protrusion.

of muscular coördination sometimes gives the impression of being the result of more centrally situated disturbances than involvement of the spinocerebellar pathways. Against the theory of more central disturbances, *viz.*, tumors in the cerebrum or cerebellum cause the predominance of pain.

The difference between cervical and thoracolumbar disc protrusions is obvious.

Cervical disc protrusions may cause severe posterior paresis or paraplegia (flaccid or spastic in nature), but the symptoms are in this case combined with motor disturbances in the front legs, with an extensor paresis the most common phenomenon. Further, the localization of pain is entirely different in a dog with cervical protrusions and in a dog with protrusions in the thoracolumbar region. The latter usually has pain mainly in the lumbar region. Dogs with thoracolumbar disc protrusions are often lively and have a good appetite in spite of paraplegia and total numbness in the hindquarters. In cervical disc protrusions, the pain seems to be much more predominant and the affected animals show a pronounced "psychic depression."

Cases with slight symptoms are easily mistaken for, and diagnosed as, myalgia and rheumatism. It has, however, been stated that, in the dog, symptoms giving rise to such suspicions usually originate from a disc protrusion. A pachymeningitis spinalis ossificans affecting cervical nerve roots may cause symptoms similar to those of a cervical disc protrusion.

Finally, a differential diagnosis between a disc protrusion and an intraspinal tumor is difficult in the dog even if different anamnesis gives valuable information. Intraspinal tumors are rare in the dog; however, this is of little practical importance.

By neurological means, we are thus able to diagnose cervical disc protrusion to a certain extent. An exact localization of the protrusion seems to be difficult in the dog without using x-ray examination and especially myelography.

A purely objective method of examination, like subarachnoid myelography, is in many cases the only reliable and definite proof of a protrusion. Such an examination should, however, be performed with the greatest care and preferably only when the dog is to undergo surgery.

The best type of myelography is the one in which thorotrast is used as a contrast medium. At the Royal Veterinary College,

this method has proved useful in more than 100 dogs with disc protrusions. At first, we used a method suggested by Nosik and Mortenson,¹⁸ *i.e.*, myelography immediately followed by forced drainage of the cerebrospinal fluid to lower the amount of residual thorotrast. Later, we gained experience in using such small doses of the contrast medium that forced drainage was considered unnecessary. In cases of cervical disc protrusion, a dose as small as 0.5 cc. of thorotrast, injected suboccipitally, is sufficient for an experienced examiner to use in, for example, a Dachshund.

THERAPY

Until recently, conservative measures (rest, vitamin B₁, and good care) have been the only means of treatment and the results have sometimes been poor. We have used surgical intervention since 1949 and we have found the method of operation called fenestration superior to laminectomy with removal of the protrusion.

During the years 1950 and 1951, 57 dogs with thoracolumbar disc protrusions were operated upon. Summarily, the following statements may be made: Disc fenestration, discriminately used, is a good method of treatment of disc protrusion in the dog. The best results are obtained in cases when pain is the main symptom. Pain and slight motor disturbances disappear completely after the operation. In a dog with only slight symptoms the risk of increasing the protrusion is eliminated by fenestration. If, however, irreversible changes in the spinal cord already exist, the operation is, naturally, useless. If the nucleus pulposus has been almost totally extruded, as in most cases with severe symptoms (paraplegia, numbness, no reflexes and sphincter disturbances), the prospect of complete or partial recovery is not promising. The disc is, in these cases, more or less played out and the issue depends upon the status of the spinal cord.

The prophylactic effect of fenestration is evident. If the nucleus is removed, nothing will be left to protrude. We, therefore, fenestrate adjacent discs when fenestrating a protruded one, knowing that protrusions often appear in these discs too.

In the 57 dogs that we have operated upon, there have been 10 relapses as far as we know and 5 of them have been reexamined (myelography or autopsy). In all cases, the relapses proved to be caused by

protrusions of nonfenestrated discs. It should be borne in mind, however, that even if three or four discs are fenestrated, there are potentially injurious ones left.

Our results encouraged us to try fenestration as a method of treatment even in cases with cervical protrusions. The injuries to the cervical portion of the cord do not seem to reach the same proportions as do those in the thoracolumbar portion. A reasonable explanation of this may be that the almost explosive emptying of the nucleus pulposus, often seen in cases of thoracolumbar protrusions, are not seen in cervical protrusions. Cervical discs are certainly not exposed to the same degree of pressure as the thoracolumbar ones. This would be especially true in jumping and running.

Theoretically, conditions should be better for attaining results with fenestration in cases with cervical protrusions than in cases with thoracolumbar localization. Besides, the cervical discs are easy to reach from the ventral side.

The 4 cases of cervical disc protrusions surgically treated (cases 5, 6, 7, and 8) have completely recovered. Conclusions should not be drawn from only 4 cases, but, together with the other 57 surgical cases, they encourage us to recommend fenestration as a suitable method of treatment of cervical disc protrusion in the dog. Further, the operation is simple and perfectly safe. The surgical technique is as follows.

Surgical Technique.—The dog is anesthetized with nembutal and placed on its back. Its head and neck are stretched out. The skin is incised along the trachea, and the discs are then easily reached by using only blunt instruments. Fenestration of the protruded disc, and perhaps also of the adjacent discs, is performed with a small lancet, making a hole of about 3 by 4 mm. in the annulus fibrosus. Nuclear material is then scooped out of the disc with a fine scoop. To find the right disc during the operation may be somewhat difficult, but by starting from the alae atlantis, orientation is usually easy. In any case of doubt, however, it is advisable to take an x-ray picture during the operation. The wound is closed in the usual manner.

Conservative Treatment.—We have discussed the result of surgical treatment. How about the conservative treatment in cases with cervical disc protrusions? Our material tells us the following.

Two of the surgical cases of cervical disc protrusion had been conservatively treated without improvement, one (dog 5) for eight weeks and another (dog 7) for three weeks before operation.

According to the case histories, 10 cases autopsied had been treated without noticeable improvement for three to seven weeks before being killed. On the other hand, 2 of our cases (dog 2 and 3) showed slight improvement after conservative treatment and in one autopsy case it was reported that a previous attack had healed spontaneously. Whether a dog in which a cervical disc protrusion has been treated conservatively can recover completely is not clear. If this were possible, it would seem to take a much longer time than does healing after disc fenestration.

SUMMARY

The authors report a clinical, roentgenological, and pathologico-anatomical study of cervical disc protrusion in the dog. The paper is intended mainly to be a contribution to the knowledge of cervical disc protrusion in the dog as a clinical entity. Autopsies have been carried out on 39 dogs with, altogether, 63 cervical protrusions.

The protrusions occurred as follows:

C2—C3	15
C3—C4	9
C4—C5	8
C5—C6	13
C6—C7	14
C7—Th1	4

On 4 of these dogs, thorough clinical examinations were performed by the authors. Another 4 dogs with cervical disc protrusions were successfully operated upon according to a method called fenestration. This method is further reported to have been used on 57 dogs with thoracolumbar disc protrusions. The results varied depending on the degree of the injury to the spinal cord by the protrusions.

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tion in cattle preferable to extensive embryotomy or severe traction.

Prolonged Gestation in Two Cows

The Cornell clinic staff reports two very similar cases of prolonged gestation in purebred, distantly related, Guernsey cows in different herds. In each case, there was a somewhat irregular breeding history and pregnancy occurred in April, 1950. Upon pregnancy examination, the uterus of both cows did not develop beyond that of a five-month pregnancy, and fluid accumulated in the uterus in the late stages.

Both cows were slaughtered, one at the 464th day of pregnancy, the other at the 473rd day. The calves were not large, weighing 50 and 62 lb., respectively, but each had four erupted incisor teeth, large hoofs, long hair, an unfused palate, the head drawn backward over the body, and the muscles of the rear limbs underdeveloped. The larger calf had subcutaneous edema 2 to 3 cm. thick over the entire body. Its fetal membranes were also edematous and weighed 17 lb. The uterus of this cow contained 7½ gal. of amber-colored fluid and that of the first cow contained 20 gal.—*Cornell Vet.*, July, 1952.

An Unusual Case of Dystocia

Ford describes (*Canad. J. Comp. Med.*, June, 1952) a fully developed, 17-month-old Holstein-Friesian heifer with a breech presentation. After correcting its position, he found the hips too large to enter the pelvis; therefore, he proceeded with a cesarean section through the right flank. The uterus had been ruptured and the dead fetus was found in the peritoneal cavity. No placental membranes could be found nor were they ever recovered. The tear in the uterus was repaired with a continuous chromic gut suture. The abdominal wall was then sutured and the heifer was given 3 million units of penicillin in oil intramuscularly and a small injection of amphetamine sulfate subcutaneously.

The next day she was eating and required no further treatment except the removal of the superficial sutures on the eighth day. The author considers the cesarean opera-

Postoperative Hernia in the Dog

Two cases in bitches are described where the median line wound opened six and seven days, respectively, following hysterectomy. In both cases, buried chromic catgut sutures had been used. Both bitches had a rough time struggling or vomiting while recovering from the anesthetic. The hernias were repaired by lightly freshening the edge of the wound, then resuturing with a through-and-through suture, taking a wider bite of the deep tissues than of the skin.

In one case, silkworm gut sutures were used, in the other, silver wire sutures. In both cases, collateral treatment prevented complications; the stitches were removed about the eighth day and recovery was uneventful. The author concludes that the stitch infections and scars which may occur with a through-and-through suture are probably preferable to the abscesses which may form during the absorption of buried sutures.—*Vet. Rec.*, July 26, 1952.

CLINICAL DATA

Terramycin and Serum Therapy for Shipping Fever

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SHIPPING fever is an insidious disease. Any factor such as inclement weather, branding, dehorning, shipping, chilling, or lack of feed may cause an upset and may contribute to its development in calves.

The losses from shipping fever should include not only the deaths but also the shrinkage and growth setback the calves undergo.

Cellular dehydration appears to be a prominent factor in shipping fever; therefore, a successful treatment must be twofold: (1) It should stimulate an increased water intake, and (2) it must also combat the infectious agents.

In treating large calf herds last fall (1951), treatment was often a problem. All calves with a temperature of 103 F. or any showing recognizable symptoms were isolated and treated daily. The balance were considered exposed and were treated en masse through the drinking water. Records were kept on each sick calf, using the tattoo or the metal ear tags for identification. The calves had access to good hay and fresh water. Tank heaters were used so the water would not be cooler than 60 F. To stimulate water intake, cornhusker compound was added at the rate of 1 gal. to 160 gal. of the warmed tank water. This mixture was given five days, skipped for three days, and then given again for three days if necessary.

For individual treatment, two forms of terramycin were used—(1) for intravenous injection and (2) for intramuscular injection. Each vial contained 1 Gm. of the crystalline antibiotic. The terramycin which is used intramuscularly differs from the intravenous form in that it contains procaine and is buffered to prolong the blood level. Before the intramuscular form of

terramycin was made available for experimental purposes, the intravenous form had been used in cases of peritonitis, calf diphtheria, and foot rot with remarkable success.

As the shipping fever outbreak progressed to epizootic proportions, the therapeutic value of terramycin became apparent because of the high recovery rate of calves so treated. After several trials, the most satisfactory results were obtained by using, on the first day, 0.5 Gm. of terramycin intravenously with 30 cc. of hemorrhagic septicemia antiserum. This was followed twenty-four hours later by an additional 0.5 Gm. of terramycin intravenously (either 5 per cent dextrose or normal saline was used as the diluent for the terramycin). This formula became routine for 350- to 400-lb. calves.

Because the intravenous method is slow and literally impossible in freezing range conditions, the terramycin solution and the serum were often given intraperitoneally. This procedure took less time and the response seemed to be as satisfactory as from the intravenous method. If sterile, spinal-type, blunt-pointed needles are forcibly thrust through the flank high in the paralumbar fossa of the right side, there is slight chance of piercing the viscera of a gaunt calf. In this manner, as many as 600 calves were treated daily. Either hemorrhagic septicemia or hog cholera antiserum was used as the diluent for the powdered terramycin for intraperitoneal use. Four grams of the intramuscular terramycin powder were added to each 250 cc. of antiserum which, then, was administered intraperitoneally with an automatic syringe with the dose adjusted to 30 cc. This gave the average calf approximately 0.5 Gm. of terramycin. For re-treatment, 25 Gm. of terramycin powder was dissolved in 250

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cc. of serum and the dose reduced to 5 cc. per calf, intramuscularly.

An attempt to prove the relative value

teurella-enteritidis antiserum. All of the calves were given cornhusker as indicated above. All recovered.

TABLE 1

380-lb. Calves	Terramycin	Serum	Second day terramycin
439	0	50 cc. s.c. HS	0
191	0.5 Gm. s.c.	30 cc. i.p. HC	0.5 Gm. i.m.
170	0.5 Gm. i.p.	15 cc. i.p. HC	0.25 Gm. i.m.
30	1.0 Gm. i.v.	30 cc. i.v. HS	0.5 Gm. i.m.

s.c. = subcutaneously; i.m. = intramuscularly; i.p. = intraperitoneally; i.v. = intravenously; HC = hog cholera antiserum; HS = hemorrhagic septicemia antiserum.

of serum and terramycin was made in one herd of feedlot Hereford range calves where 60 had died and 830 required treatment for shipping fever. The calves were divided into four lots. Feed and warm water facilities were made available to each lot. They were treated as shown in table 1.

About twenty-eight days after treatment, we were notified that 91 of the 439 steers that received hemorrhagic septicemia antiserum alone had suffered a relapse, with complications and considerable scouring. They were then given the routine 30 cc. of hog cholera antiserum with 0.5 Gm. of terramycin intraperitoneally, followed twenty-four hours later by 0.5 Gm. of terramycin intramuscularly. They recovered completely though somewhat slowly. The other calves had recovered uneventfully.

It often is ethically impossible to establish untreated controls in a client's herd, but one enterprising cattleman suggested that we "see what we can learn on 16 cutback calves too sick to even hope for their recovery." Their temperatures were from 98.5 to 103.0 F. and they were treated as shown in table 2.

TABLE 2

363-lb. Calves	Terramycin—first day	Terramycin—second day
4	1.0 Gm. i.v.	0
4	0.5 Gm. i.v.	0.5 Gm. i.v.
8	0.5 Gm. + 40 cc. HC serum i.p.	0.5 Gm. i.m.

The third day following treatment, all of the calves were much improved. It was noticeable, however, that the calves that had received terramycin plus hog cholera antiserum were recovering more rapidly than those on antibiotics alone. The latter calves were then each given 50 cc. of coli-Pas-

SUMMARY

This report is compiled from observations on approximately 4,500 calves which were treated for shipping fever. The 846 calves mentioned in this study are a part of those which were visibly sick and whose temperatures were recorded.

The recovery of calves treated with the terramycin and serum combinations is almost dramatic. Several of the large herds of 400 to 900 calves had incurred death losses of 25 to 50 calves prior to treatment. In several cases, no further losses from shipping fever were reported after the second day following treatment.

Actual recovery of calves treated with terramycin and serum or foreign protein has been approximately 96 per cent.

Calves which received terramycin and outdated hog cholera antiserum responded most favorably after treatment.

Perhaps more important than the immediate recovery has been the way the calves matured throughout the following summer. The owner reports that he can scarcely find a half dozen poor calves in the lot of 830 in which 60 had died prior to treatment.

Antibiotics and Leptospirosis.—The comparative therapeutic value of three antibiotics and of three immune serums against *Leptospira canicola* infection was tested in golden hamsters. Aureomycin was effective when commenced within thirty-two hours of experimental infection. Terramycin was effective up to forty-eight hours after infection but chloromycetin had no therapeutic effect. Of the three immune serums prepared from rabbits, only one was effective.—*Vet. Bull., July, 1952.*

Salmonellosis in Man and Animals.—Of the food poisoning cases which occurred in Britain during 1949, 91 per cent were due to *Salmonella* infections. *Salmonella typhimurium* was responsible for 75 per cent. The foods usually involved were processed meat and duck eggs. It was noted that both this organism and *Salmonella enteritidis* sometimes infect duck ovaries.—*Vet. Bull., July, 1952.*

Brucella Suis Infection in Suckling and Weanling Pigs. I

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THE SUCCESS of the procedures recommended for control of swine brucellosis at the fifty-third annual meeting of the United States Livestock Sanitary Association¹⁰ is dependent to a marked extent on a thorough knowledge of *Brucella suis* infection in suckling and weanling pigs. Every effort has been made to investigate all the ramifications of this disease as well as factors that influence its course in young pigs. The information to be presented concerns the susceptibility of suckling and weanling pigs to *Br. suis* infection, relationship of infection rate in pigs to the nature of the disease in their dams, transmission of brucellosis from infected to susceptible pigs of similar ages, and course of the disease in both males and females from weaning date to various ages of maturity.

REVIEW OF LITERATURE

Information on brucellosis in young pigs has appeared in the literature since 1921.

Connaway, Durant, and Newman¹ reported that pigs farrowed by Brucella-reacting sows showed a positive reaction at birth or soon thereafter and these reactions persisted for a variable period in different litters. In most instances, the young swine appeared to destroy the infection, or at least to eliminate the specific antibodies, in three to fifteen weeks. Although sufficient data was unavailable, these authors suggested that non-reacting progeny could be raised from infected sows.

Hayes and Phipps² stated that their limited observations indicated that neither agglutinins nor virulent Brucella organisms are transmitted to the offspring at birth or during the suckling period. They suggested that the appearance of Brucella agglutinins in the blood of 17 of 34 pigs was caused by exposure to infected environment after weaning rather than to latent infection caused by exposure to infected dams during the suckling period.

Results reported by Hadley and Beach³ indicated that only a small percentage of pigs, that sucked reacting sows, react to the agglutination test.

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Furthermore, the agglutinins had a tendency to disappear rapidly from these pigs.

A report by the University of Illinois¹¹ in 1923 stated that the danger of establishing permanent infection in pigs under 2 months of age is insignificant. Female pigs, artificially infected at weaning time, apparently overcome infection as shown by negative bacteriological and serological findings at the following farrowing.

Graham, Boughton, and Tunncliffe¹² observed a weak agglutinin response in 22 male pigs that received a single feeding of Brucella organisms of porcine origin when they were 45 days of age. Because of the results obtained, the authors concluded that young pigs are quite resistant to brucellosis.

Howarth and Hayes¹³ reported that a majority of 43 pigs from 8 reacting dams remained negative to the agglutination test for approximately four months after weaning. The pigs were in constant contact with other reacting swine as well as their dams. These results led the authors to believe that young swine do not become readily infected up to at least 4 months of age.

Thomsen¹⁴ of Denmark investigated the possibility of infected suckling pigs becoming spreaders of brucellosis. He exposed 13 newborn pigs by giving a suspension of *Br. suis* organisms *per os*. It was found that 4 pigs became permanently infected, 2 for as long as one year.

McNutt and Leith¹⁵ found only a low percentage of pigs from infected dams to be reactors to the agglutination test. They interpreted their findings as indicating that young pigs are resistant to infection or fail to react even though infected, with the latter alternative seeming to be less likely.

Experiments conducted by Hutchings, Delez, and Donham¹⁶ demonstrated that a high percentage of heterogeneous pigs were readily infected at approximately 3 months of age with *Br. suis* organisms through various channels as measured by agglutination and bacteriological results. All of 21 gilts, exposed at 3 months of age, farrowed full term litters at termination of their first pregnancies. No isolations of *Br. suis* were made at that time.

MATERIALS AND METHODS

Studies were conducted on 230 pigs naturally exposed to dams that were previously exposed to virulent *Br. suis* organisms. All of the sows artificially infected were exposed to a lyophilized strain of *Br. suis* identified as 3-Boars. This culture was obtained from aborted fetuses of a sow which had been exposed to a polyvalent suspension of three strains of *Br. suis*. The strains had

been isolated from boars that originated from three sources. The 230 pigs were divided into two groups according to the time that they were farrowed. Pigs in group A were born approximately one year prior to those in group B. Bacteriological and serological examinations of blood were first made on the day the pigs were weaned.

Group A consisted of 30 pigs farrowed by 9 sows that were previously exposed to virulent *Br. suis* organisms during the middle one-third of the current pregnancy. *Brucella suis* was isolated from 7 of the 9 sows at the time of farrowing and all showed agglutinin titers of 1:25 or higher. Each litter was maintained separately during the suckling period. Pigs were weaned at ages varying from 66 to 84 days, the average being 78 days. Each litter was placed in clean pens at the time of weaning and held in isolation for one month. During this period, bacteriological and serological examinations were made on three collections of blood from each pig to determine their brucellosis status. The purpose of using the one month postweaning period for establishing the brucellosis status of each pig was to permit pigs that were in the incubation stage of the disease at the time of weaning to exhibit evidence of infection. Isolations of *Br. suis* or demonstration of agglutinins in a serum dilution of 1:25 or higher was considered evidence of infection. After the brucellosis status of each pig was determined, uninfected animals were separated from infected litter mates. Approximately three months after weaning, the infected pigs were separated into two groups according to sex and placed in Brucella-free lots.

Three of the gilts that had sucked infected dams, but failed to show any evidence of brucellosis for three months after weaning, were placed in contact with the infected gilts for further study. One gilt, A-11, had 2 infected and 5 uninfected litter mates. The other 2 gilts, A-21 and A-22, were the only survivors of the litter. Both dams had udder and genital infection at the time of farrowing.

In an effort to obtain information on the transmission of brucellosis from gilts infected as suckling pigs to susceptible gilts, 5 gilts from a Brucella-free source were placed in contact with infected gilts. Preexposure agglutination tests were negative in the 1:25 dilution of serum. All the gilts were approximately 8 months old at the time.

Group B consisted of 200 pigs farrowed by 42 sows. Twenty-eight of the sows had been exposed during the previous pregnancy and reexposed during the first one-third of the current pregnancy. The remaining 14 received their primary exposure at the time of breeding or shortly after conception to the current pregnancy. Agglutinin titers of 1:25 or higher were demonstrated in the blood serum of 31 of 42 sows at farrowing time and *Br. suis* was isolated from 10. Construction in one barn, where 24 litters were housed, did not provide isolation for the suckling

pigs. Consequently, all pigs had the opportunity to receive exposure from infected swine and premises other than their dams or litter mates. In the other barn, each litter was isolated. Pigs were weaned at ages varying from 58 to 79 days, the average being 70 days. Postweaning management of the pigs in this group was essentially the same as that employed in group A.

Fourteen gilts that had not exhibited evidence of brucellosis during a postweaning period of three months, although they had nursed previously exposed sows, were then placed in contact with the infected gilts. These 14 gilts were selected from ten uninfected litters. The 10 dams and their litters had been maintained separately during the suckling period. Seven of the dams had titers of 1:50 or higher at the time of farrowing, whereas in the other 3 they had receded below 1:25. None of the sows had udder infection, but *Br. suis* was isolated from the uterine material and fetuses of 1. Two of the 14 gilts were farrowed by this sow and are identified as B-52 and B-54. The 14 gilts were weaned at an average age of 73 days. Three more unbred sows, from a Brucella-free source, were added to the lot of principals and controls when all the swine were approximately 1 year old. Preexposure agglutination tests were negative.

Blood was collected aseptically for bacteriological and serological examinations according to the method described by Carle and Dewhirst.¹ Collections were first made at the time of weaning or when pigs entered the experiment and bi-weekly or monthly for the next twelve months. Following this period, blood specimens were obtained bimonthly for the remainder of pig's life.

Bacteriological examinations for *Br. suis* were made on each collection of blood according to the following procedure: Sterile beef infusion broth, containing 1 per cent sodium citrate, was employed for primary culturing. Duplicate flasks of broth were inoculated with 5 to 15 ml. of blood from each pig at each collection. Following primary incubation at 37 C. for ten to fourteen days, 0.2 ml. amounts of blood broth cultures were plated on serum-potato agar plates. After the plates had been incubated for five to seven days, they were examined for *Brucella* colonies.

Serum-agglutination tests were conducted on blood serums of swine by both the plate and tube methods at the time blood was collected for culture. Standardized plate and tube antigens, produced by the Bureau of Animal Industry, were employed. End point titers were determined on all serum samples by the tube method. Serums were tested in twofold dilutions, beginning with 1:25. Any dilution that showed 50 per cent agglutination or higher was considered positive, whereas trace reactions were disregarded.

Sows infected as suckling pigs and sows receiving contact exposure to the infected swine were bred to Brucella-free boars. Breeding was delayed because facilities were not available for farrowing until the sows were approximately 1½ years

of age. At the time of parturition, colostrum and uterine material were collected for direct culture and inoculation into guinea pigs. At least 4 newborn pigs from each litter were cultured for *Br. suis*. Blood was also collected for direct culture and titer determinations.

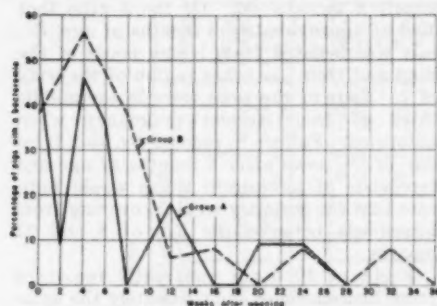


Fig. 1—Incidence of bacteremia in infected weanling pigs.

Semen was collected at various intervals for direct culture and guinea pig inoculations from the 7 boars in group B after they had reached the age of 2 years. Susceptible sows were also bred to boar B-217.

All swine brought to autopsy were carefully observed for gross pathological lesions, and tissues were obtained for direct culture to determine the sites of localized infection in the body. The tissues examined were lymph glands, urogenital organs, spleen, and liver. Agglutination tests and bacteriological examinations were also made on the blood.

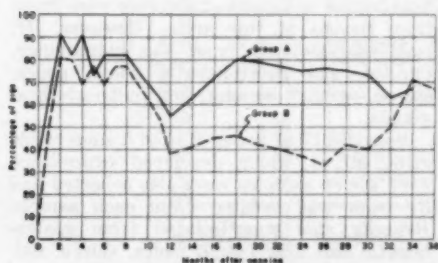


Fig. 2—Percentage of infected weanling pigs showing a blood serum-agglutinin titer of 1:25 or higher.

EXPERIMENTAL RESULTS

The percentage of pigs that became infected with *Br. suis* was considerably higher in group A than in group B. Eleven of 30

pigs (36.6%) in group A and only 16 of 200 pigs (8%) in group B showed evidence of having brucellosis at weaning time or during the one-month postweaning period. Except for the slightly older weaning age of pigs in group A, the management of the two groups involved was essentially the same. Most of the sows in group A had subacute brucellosis, whereas those in group B either had chronic brucellosis or had recovered from the disease at the time they farrowed and suckled their pigs. All of the evidence shows that the high incidence of brucellosis in weanling pigs of group A was associated with severe natural exposure to sows with subacute infection.

In this experiment, gilts were more susceptible than boars to *Br. suis* infection during the suckling period. The percentage of infection in gilts (16.5) was approximately double that in boars (7.87). Translated in numbers of pigs in each group, brucellosis was demonstrated in 8 of 15 gilts and 3 of 15 boars in group A and 9 of 88 gilts and 7 of 112 boars in group B. According to results obtained by Hutchings *et al.*⁸ there was no difference in susceptibility between gilts and boars when the dose and method of exposure were the same. Under the conditions of natural exposure existing in this experiment, it was impossible to estimate accurately the degree of exposure each pig received and its influence on the infection rate in boars and gilts.

The results of culturing the blood of infected weanling pigs are presented in figure 1. The greatest percentage of *Br. suis* recoveries from both groups of pigs occurred at the time of weaning or one month thereafter. Bacteremia did not persist in the majority of swine beyond three months after weaning or when they were approxi-

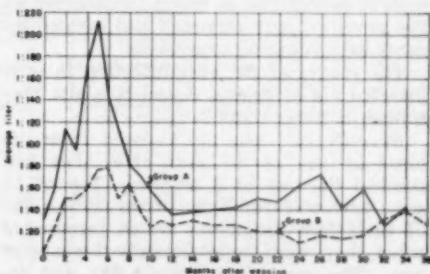


Fig. 3—Average blood serum-agglutinin titers of infected weanling pigs.

mately 5½ months of age. Further information on blood stream infection in individual pigs is presented in tables 1 and 2. *Brucella suis* was isolated at least once from every pig in group A, compared with 13 of 16 in group B. Bacteremia also had a tendency to persist longer in a higher percentage of boars than sows.

The percentage of infected weanling pigs showing agglutinin titers of 1:25 or higher at various postweaning intervals is presented in figure 2. Using the above criterion for diagnosing *Br. suis* infection in suckling or weanling pigs, the highest percentage of pigs showing a diagnostic titer occurred two months following weaning or approximately one month following the highest incidence of blood stream infection. The time that individual animals developed their primary and maximum agglutinin titers is also given in tables 1 and 2. *Brucella* agglutinins were not demonstrated in the 1:25 dilution of blood serum of 1 gilt in each group although both had a temporary bacteremia.

Average agglutinin titers at regular postweaning intervals in the infected pigs of each group are given in figure 3. The purpose of this figure is to demonstrate the trend rather than the exact titers of pigs. Average agglutinin titers of pigs in the two groups were highest between five and six months after weaning, or four months after the peak of bacteremia. The agglutinin response was greater in group A than group B throughout the entire experiment. Only 1 of 16 pigs in group B showed an agglutinin titer at time of weaning as compared with 4 of 11 in group A.

In reviewing results presented up to this point, the highest incidence of blood infection, the highest agglutinin titers, and the highest percentage of infection occurred in the group of pigs farrowed and suckled by dams with subacute brucellosis.

The course of *Br. suis* infection in each infected pig of groups A and B is also presented in tables 1 and 2.

Brucella suis was not isolated from the blood of any of the gilts after they had reached the age of 8 months. Ten of 11 sows farrowed full-term litters at the end of their first pregnancy which terminated when they were approximately 2 years of age. The remaining sow (A-28) was destroyed on the ninety-seventh day of gestation because of paralysis. Only 3 sows had

agglutinin titers higher than 1:25 and no isolations of *Br. suis* were made at that time.

Furthermore, *Br. suis* was not isolated from any of the gilts or sows at the time of autopsy, except the 2 that were approximately 6 months old. Of the 3 gilts that died at approximately 6 months of age, *Br. suis* was isolated from lymph nodes of the head and from one other region of the body of 2. Four of the sows were in the middle third of their second pregnancy when autopsied. Failure to recover *Br. suis* from any of the sows after 8 months of age and recedence of agglutinin titers would indicate that the majority were recovering from brucellosis between the age of 8 and 21 months.

Eight of 10 boars apparently recovered from brucellosis at approximately the same time as the gilts. The other 2 boars, A-26 and B-217, had the most persistent blood infection of either sex and remained infected for at least twenty-eight and fifty-two months, respectively. Furthermore, they were the only swine infected as suckling pigs that consistently showed serum agglutinin titers above 1:100. None of the boars showed clinical evidence of brucellosis.

Boar A-26 was destroyed because of progressive incoordination of the front legs. No semen samples were collected from this boar, and he had not been used for breeding. At the time of autopsy, there was spondylosis of the first five thoracic vertebrae but no isolations of *Br. suis* were made from tissues of this area. However, *Br. suis* was isolated from the mandibular, parotid, and gastrohepatic lymph nodes, spleen, urinary bladder, and bulbo-urethral glands.

Boar B-217 of group B bred 5 susceptible gilts, all of which developed brucellosis. Five semen samples were also collected and *Br. suis* was isolated from each sample. *Brucella suis* was isolated from gastrohepatic and iliac lymph nodes, spleen, urinary bladder, both testicles, epididymis of the left testicle, prostate, and left lobe of the seminal vesicles at autopsy. The left lobe of the seminal vesicles was approximately three times larger than the right lobe and contained numerous miliary abscesses.

No uninfected boars were placed with boars infected as suckling pigs; conse-

TABLE 1.—Brucellosis in Sows Naturally Infected as Suckling Pigs

Swine No.	Age of pigs at weaning (days)	Examination of Blood				Reproduction Record				Postmortem Examination		
		First aggl. titer	Maximum Aggl. titer	Bacteriology		No. of times bred	Gestation period (days)	Parturitions*		Blood aggl. titer	Bact. exam. for Br.	Age of swine (No.)
				Age of pig at last recovery (days)	No. of Brucella recoveries			L	U			
Group A												
A-10	84	131	1:1600	228	4	2	114	5	3	1:50	1:50	37
A-15	84	131	1:800	228	2	1	113	6	4	1:100	"	37
A-17	76	123	1:200	171	3	0	"	"	"	1:25	"	21
A-19	76	104	1:100	852	1	1	112	5	2	1:25	1:50	37
A-20	76	"	"	"	1	0	104	"	"	"	"	36
A-27	81	81	1:100	109	2	1	118	9	0	"	"	37
A-28	81	81	1:400	128	1	3	97#	0	7	1:25	1:25	24
A-29	81	81	1:200	109	2	1	114	10	0	1:50	1:100	37
Group B												
B-46	70	105	1:400	254	0	1	115	10	0	1:25	1:50	38
B-47	70	132	1:400	226	3	1	116	7	6	"	"	40
B-100	70	132	1:100	358	2	1	117	5	0	"	1:25	38
B-102	70	132	1:25	132	2	0	"	"	"	"	"	26
B-104	70	105	1:50	105	1	2	113	10	0	"	1:50	38
B-153	67	102	1:100	102	0	0	"	"	"	"	1:100	5.5
B-156	67	111	"	"	1	1	116	7	0	"	"	38
B-167	76	"	1:25	111	2	0	"	"	"	"	"	6
B-204	58	93	1:200	93	0	0	"	"	"	"	"	5.5

* = No recoveries of Brucella suis at termination of pregnancy; ‡ = sow killed at birth; Bact. = bacteriological; Exam. = examination; — = no agglutination in the on ninety-seventh day of gestation; Aggl. = agglutinin; L = living at birth; D = dead 1:25 dilution or higher; Neg. = no Brucella recoveries; Psa. = Brucella recoveries.

TABLE 2—Brucellosis in Bears Naturally Infected as Suckling Pigs

Swine No.	Age of pigs at weaning (days)	Blood Examination				Bacteriology		Semen Examination		Postmortem Examination			
		First aggl. titer	Maximum Aggl. titer	Age of pigs (days)	Age of pig at last recovery (days)	No. of Brucella recoveries	Age of pig at last recovery (days)	No. of collections	No. of Brucella recoveries	Bact. exam. for Br. titer	Blood aggl. titer	Age of swine (No.)	
Group A													
A-7	66	84	1:200	126	2	224	0	0		Neg.	—	19	
A-18	76	104	1:50	136	1	76	0	0		"	1:25	35	
A-26	81	81	1:400	197	3	261	0	0		Pos.	1:200	28	
Group B													
B-103	70	105	1:100	132	1	105	5	5	0	Neg.	1:25	39	
B-133	79	79	1:100	235	1	79	6	6	0	"	1:25	40	
B-170	63	98	1:100	125	3	125	7	7	0	"	1:25	39	
B-171	63	125	1:100	219	2	125	5	5	0	"	1:25	39	
B-188	76	111	1:200	173	3	138	6	6	0	"	1:50	39	
B-217	79	114	1:200	141	3	326	5	5	5	Pos.	1:200	52	
B-218	72	134	1:100	169	1	107	5	5	0	Neg.	—	39	

Aggl. = agglutinin; Bact. exam. = bacteriological examination; — = no agglutination in the 1:25 dilution or higher; Neg. = no Brucella recoveries; Pos. = Brucella recoveries.

quently, we have no information on their ability to transmit brucellosis to susceptible swine of the same sex.

Some information was obtained on the transmission of brucellosis from gilts infected as suckling pigs to susceptible gilts. Although some of the control gilts used for contact exposure were not from a *Brucella*-free source, results obtained in this part of the studies did furnish some leads for future investigation.

Results of brucellosis transmission in gilts in groups A and B are given in detail in table 3.

In gilts receiving contact exposure in group A, gilt A-11 was the only 1 that developed a demonstrable bacteremia. Only one isolation of *Br. suis* was made from the blood and that occurred nine weeks after being placed in contact with the infected gilts, or five months after weaning. Since this gilt originated from an infected litter, it can not be stated with certainty that infection was the result of contact exposure to infected gilts after weaning. The course of infection was similar in many respects to that observed in infected suckling gilts and the disease may have assumed a latent form. Gilts A-21 and A-22 showed an agglutinin titer of 1:25 only once. Agglutinin titers of the 5 gilts from a *Brucella*-free source fluctuated considerably and only reached a maximum of 1:50 in 3. There is a good possibility that the slight response in the 5 gilts was due to a decrease in the amount of exposure received during the period they were in contact with infected gilts. They received their first contact exposure at the time *Br. suis* was last isolated from the blood and agglutinin titers were declining rapidly in the infected gilts in group A.

The course of brucellosis in the contact control gilts of group B was similar in many respects to that observed in the gilts of group A. However, *Br. suis* was not demonstrated in the blood of any of the contact gilts in group B prior to or during the time they received exposure to infected gilts. The principal difference between the two groups was recovery of *Br. suis* from 3 of 14 gilts at the time of autopsy. The only isolation of *Brucella* from gilt B-52 was from the mandibular lymph nodes. In gilt B-67, isolations of *Br. suis* were made from the mandibular, retropharyngeal, gastrohepatic, iliac, and supramammary lymph

nodes. Brucellosis was more generalized in gilt B-110 as demonstrated by isolations of *Br. suis* from the liver and spleen as well as mandibular, parotid, retropharyngeal, bronchial, and gastrohepatic lymph nodes. The two gilts, B-89 and B-198, that died at 6 to 6½ months of age did not show any evidence of brucellosis at autopsy. This bit of information is an indication that latent infection did not exist in the 14 control gilts from uninfected litters although they had sucked recovered or chronically infected dams. The remaining 3 control gilts that originated from a *Brucella*-free source showed infrequent low agglutinin titers and were not retained for autopsy.

There does not appear to be any significant difference in the reproduction records of gilts infected as suckling pigs or gilts maintained in contact with them. The gilts that have no breeding record had either died prior to being bred or showed no signs of estrus. Failure of some sows to conceive may have been caused by over-conditioning. All except 1 of the control gilts that conceived farrowed full-term litters at termination of their first pregnancy. Sow B-209 died on the 111th day of gestation. Bacteriological examinations on uterine material, colostrum, and fetuses of all the sows were negative for *Brucella*.

DISCUSSION

Studies on two groups of weanling pigs, naturally infected by sucking infected sows, have revealed information pertinent to the control and eradication of brucellosis in swine.

Under the conditions of this experiment, the percentage of *Br. suis* infection observed in suckling or weanling pigs was related to the nature of the disease existing in the dams at the time of farrowing. If brucellosis has recently gained entrance to a herd during the current breeding season, the percentage of infected suckling pigs is likely to be higher than when brucellosis has been present in the breeding herd for one year or longer. Furthermore, maximum serum-agglutinin titers averaged 1:368 in infected weanling pigs farrowed by sows with subacute brucellosis as compared with titers of 1:150 in those farrowed by sows that had recovered from brucellosis or had chronic brucellosis.

The nature of the disease in dams, however, had little or no influence on the time

TABLE 3.—Results of Exposing Gilts to Infected Weanling Pigs

Swine No.	Age at weaning	Age at beginning of exposure	Examination of Blood*			No. of service	Reproduction Record		Postmortem Examination				
			First aggl. titer	Length of exposure	Serum dilution		Length of exposure	No. of pigs L - D	Blood aggl. titers	Bact. exam. for Br. titers	Age of swine (mos.)		
												Gestation period (days)	Parturitions*
Group A													
A-11...	84 days	164 days	9 wks.	28 mos.	1:100	1	115	6 - 0	1:50	1:50	Neg.	38	
A-21...	77 "	157 "	28 mos.	28 "	1:25	1	115	10 - 0	-	-	"	37	
A-22...	77 "	157 "	23 "	23 "	1:25	1	114	11 - 2	-	-	"	37	
A-31...	Unknown	8 mos.	7 "	7 "	1:50	2	NP				"	36	
A-32...	"	"	7 "	13 "	1:50	2	NP				"	36	
A-33...	"	"	3 wks.	3 wks.	1:25	1	NP				"	36	
A-34...	"	"	3 "	3 "	1:25	1	116	1 - 3	-	-	"	36	
A-35...	"	"	3 "	20 mos.	1:50	1	112	0 - 7	1:25	1:25	"	36	
Group B													
B-52...	63 days	159 days	24 mos.	34 mos.	1:50	2	NP	9 - 2	-	-	Pos.	39	
B-54...	63 "	159 "	3 "	3 "	1:25	1	115				Neg.	38	
B-67...	74 "	170 "	14 "	14 "	1:50	2	NP				Pos.	38	
B-71...	74 "	170 "	16 "	16 "	1:25	0					Neg.	22	
B-80...	81 "	177 "	"	16 "	-	0					"	22	
B-89...	83 "	179 "	8 "	17 days	-	0	114	9 - 4	1:25	1:25	"	6, 5	
B-90...	83 "	179 "	"	8 mos.	1:50	2	114	7 - 5	-	-	Pos.	51	
B-110...	72 "	168 "	4 wks.	14 "	-	1	114	10 - 3	-	-	"	39	
B-118...	62 "	158 "	4 wks.	4 wks.	1:50	1	114	6 - 0	-	-	1:25	38	
B-138...	76 "	172 "	3 mos.	3 mos.	1:100	1	117	6 - 0	-	-	"	38	
B-150...	79 "	175 "	14 "	14 "	1:25	1	118	5 - 1	-	-	"	39	
B-198...	68 "	164 "	10 days	10 days	1:25	0	111#	0 - 4	-	-	1:25	6	
B-207...	74 "	170 "	8 mos.	8 mos.	1:25	1	114	9 - 2	-	-	"	39	
B-209...	74 "	170 "	24 "	24 "	1:50	1	114	9 - 0	-	-	"	21	
B-2448...	Unknown	12 mos.	12 mos.	12 "	1:50	1	116	9 - 0	1:25	1:25	"		
B-2495...	"	12 "	10 "	12 "	1:25	1	114	9 - 0	-	-	"		
B-2739...	"	12 "	12 "	12 "	1:25	1	114	9 - 0	-	-	"		

* Pig with infected litter mates; #—pigs that sucked infected or recovered dams but from Brucella-free litters; —pigs from a Brucella-free source; x—no recoveries of Br. suis from the blood of pigs except A/11; 9—no recoveries of Br. suis recoveries; Pos.—Brucella recoveries.

required for the development of serum-agglutinin titers of 1:25 or higher in infected pigs after weaning. The highest percentage of infected pigs showing titers of 1:25 or higher occurred two months after weaning in both groups. Considering titers of 1:25 as significant, 91 per cent of the pigs in group A and 81 per cent in group B would have been classified as infected at that time. Although only a relatively small number of infected pigs exhibited agglutinin titers at the time of weaning, slightly more than 50 per cent would have been considered reactors one month after weaning. All of the infected weanling pigs showed serum-agglutinin titers of 1:25 or higher within sixty-two days after weaning, except 2 gilts. The concentration of *Brucella* agglutinins was not sufficiently high, in these 2 gilts, to be detected in the 1:25 dilution of blood serum at any time, although *Br. suis* was isolated once from the blood of each.

Except for maximum agglutinin titers, the course of brucellosis was essentially the same in both groups of infected pigs. According to the trend of agglutinin titers and last isolations of *Br. suis* from routine collections of blood or from body tissues at the time of autopsy, all infected weanling gilts and 8 of 10 boars were recovering from the disease when they were approximately 1 year of age. Only 2 boars developed chronic brucellosis, both of which had localized infection of the urinary bladder and genital organs. The 1 boar that was used for breeding was capable of transmitting *Br. suis* infection to susceptible sows until he was 52 months of age.

The evidence submitted in this paper, although not absolute, certainly indicates that brucellosis was transmitted by contact from infected weanling gilts to gilts of similar ages. All but 4 of 25 susceptible gilts developed agglutinin titers of 1:25 or higher at some time during contact exposure. Although 14 of the uninfected gilts in group B had sucked sows with chronic brucellosis or sows that had recovered from the disease, neither they nor their litter mates had shown any evidence of being infected prior to 5 months of age, which was the time they were placed in contact with infected gilts. Moreover, when a number of principals and contact controls were brought to autopsy at 3 years of age, *Br. suis* was isolated from only 3 contact control sows. This suggests

that sows infected after 5 months of age are more likely to develop chronic brucellosis than those infected as suckling pigs.

In group A, *Br. suis* was isolated from only 1 of the contact control gilts. This single isolation was made from the blood nine weeks after being in contact with infected weanling gilts. Although the gilt had showed no evidence of being infected until after exposure to infected gilts, the course of infection was similar to that in her 2 litter mates which were infected as suckling pigs. The method of how or when she became infected is purely speculative. The two possibilities are that this gilt had a latent infection acquired before weaning, or she acquired brucellosis after being in contact with infected weanling gilts. In any event, weanling gilts with unrecognized latent infection may be the same potential source for disseminating *Br. suis* to susceptible swine as weanling gilts with recognized infection.

When pigs are infected during the suckling period, *Br. suis* infection appears to have more of a tendency to become chronic in boars than in sows and to localize in the genital organs. These boars may not show any clinical evidence of brucellosis but are capable of transmitting the infection to susceptible sows through the semen at the time of breeding.

The results of this research suggest that the present agglutination testing methods are capable of diagnosing brucellosis in a high percentage of infected weanling pigs. In order to realize maximum efficiency of the test, an agglutinin titer of 1:25 must be considered as significant in pigs from an infected herd and the test must be conducted at the time of weaning and at thirty-day intervals for at least two months or longer. This procedure provides for an early diagnosis of brucellosis in weanling pigs so that they can be removed from the herd and prevent further exposure of susceptible pigs.

Certain principles of disease control must be applied to assure success of any program. In a program of replacing the infected breeding herd with their progeny, it is necessary to identify the infected weanling pigs and segregate the uninfected pigs in a *Brucella*-free environment. Approved sanitary measures should be employed to prevent further exposure of uninfected pigs to *Br. suis* infection.

More conclusive information on latent infection in suckling and weanling pigs, transmission of brucellosis in weanling pigs, and effect of weaning age on the rate of infection and course of disease in suckling and weanling pigs is presented in a second paper by Goode, Manthei, Amerault, and Blake.³

SUMMARY

The percentage of pigs (36.6) that acquired brucellosis from suckling dams with subacute infection was higher than in those (8.0) that sucked dams with chronic infection. Gilts were more susceptible than boars in both groups of suckling pigs.

The highest incidence of *Brucella suis* recoveries from the blood of infected suckling pigs occurred at the time of weaning or within one month thereafter. Blood stream infection was demonstrated in 14 of 17 infected gilts and in all of the 10 boars. Bacteremias persisted for as long as 261 and 326 days in 2 boars.

The time that the largest number of infected pigs showed blood serum-agglutinin titers of 1:25 or higher was two months after weaning. Maximum blood titers followed the highest incidence of blood stream infection in pigs by approximately four to five months. Agglutinin titers had receded to the lower diagnostic levels in most pigs by the time they were yearlings.

None of the 17 female swine, infected as suckling pigs, developed chronic brucellosis. *Brucella suis* was not isolated from any of those animals at the time of autopsy, except the 2 that were approximately 6 months of age. Two of 10 infected suckling boars developed chronic brucellosis with localization of infection in the urogenital tract. *Brucella suis* was isolated from the semen of 1 boar. This boar also transmitted infection to 5 susceptible sows by natural service.

Of the 25 uninfected gilts that were exposed to infected weanling gilts of the same age, 21 showed intermittent agglutinin titers of 1:25 or higher.

Brucella suis was isolated from the body tissues of 3 sows at the time of autopsy, when they were approximately 3 years of age, and from the blood of another when she was 9 months old.

The reproduction records of sows infected as suckling pigs was similar to that of sows infected as weanling pigs. None of the sows aborted, nor was *Br. suis* isolated

from them at termination of their first pregnancy.

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Gamma Globulins for Poliomyelitis

In an attempt to check the ravages of poliomyelitis, 33,000 youngsters from 1 to 6 years old at Houston, Texas, and 16,000 children from 1 to 11 years old at Sioux City, Iowa, were vaccinated. Half of them were given gamma globulin injections and the other half were given dummy injections, as controls.

It will be three to four months before the value of the gamma globulin, said to be blood serum globulin manufactured by the body in small granules in the cytoplasm of cells, will be known and reported. If during their formation any antigen is present, they will develop antibodies against that antigen. It is hoped that the gamma globulin used in these children contains enough antibodies against poliomyelitis to give them some protection.—Sci. Newsletter, Aug. 2, 1952.

A Comparative Study of the Reaction of Dogs as a Susceptible Species to Sublethal Doses of Aldrin and Dieldrin

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ALDRIN ($C_{12}H_{11}Cl_6$) and dieldrin ($C_{12}H_8Cl_6O$)* are insecticides of known high biological activity and thus warrant toxicological investigation on several species of animals so as to approximate their probable effect on man. Since many data have been accumulated concerning the toxicity of these compounds to small animals, it seemed desirable to investigate the response of dogs to varying concentrations. This is a report of such a study.

A good example of the difference in species susceptibility to pesticides was observed by Larson, Finnegan, and Haag when they studied the rate of elimination of nicotine by the cat, dog, rabbit, and mouse. They found the cat able to dispose of the toxic materials 50 times faster than the dog and 2.3 times faster than the mouse. A similar experience was reported by Dudley, Henry, and Lindsley who noted that gallium lactate was far more toxic for goats and dogs than for small animals such as rats and mice. In their studies, the l.d.₅₀ for this material for dogs was 10 to 15 mg. per kilogram of body weight as compared with 100 to 240 mg. per kilogram of body weight for rats.

Factors influencing toxicity besides simple species susceptibility are: the age of the animal, the tissues involved in storage or detoxification, and the menstrum employed in the administration of the materials. For instance, in the toxicity studies

of toxaphene in dogs and rats, Lackey reported that when corn oil was used as a vehicle, the l.d.₅₀ was 25 p.p.m. but if kerosene were substituted the value was above 400 p.p.m.

Laug and Kunze reported that although methoxychlor has a very low order of toxicity, if carbon tetrachloride is given concurrently, the compound is far more lethal and greater quantities are stored in the mesenteric fat and liver. Gerebtzoff and Dallemagne demonstrated that increasing the amount of olive oil administered as a carrier decreased the toxicity of lindane.

The tissue storage and detoxification are important and depend upon differential solubilities and the avidity of various cells for particular compounds, thus permitting prolongation of the effect and causing more extensive changes or, on the other hand, bringing a greater margin of safety. For example, Finnegan, Haag and Larson reported greater relative storage of DDT and DDD in the rat than in the dog. Laug, Nelson, Fitzhugh and Kunze noted a selective accumulation of DDT in the adipose tissue in dosages as low as 1 p.p.m., with 50 to 75 per cent persisting after the animal had been returned to an ordinary ration. After three months, 25 per cent of the toxicant remained in the animal's body.

The age of the animal is a critical variable; for example, it has been shown by the work at the Kettering Laboratory that weanling dogs are much more susceptible to certain chlorinated hydrocarbons than are older animals.

The authors demonstrated that the l.d.₅₀ for rats lies between 38 to 49 p.p.m. for aldrin and 35 to 50 p.p.m. for dieldrin. Recognizing that dogs are more susceptible to these compounds, it was deemed desirable to explore further possible differences by utilizing this particular laboratory animal.

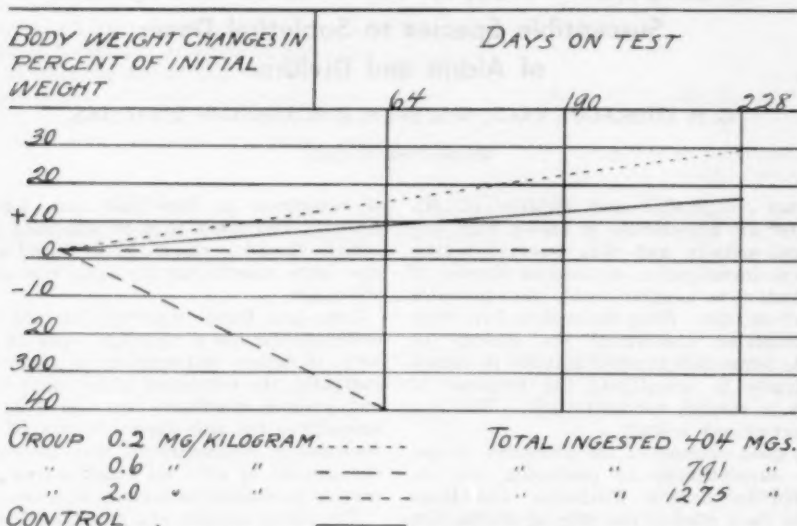
MATERIALS AND METHODS

The dogs employed were mixed breeds obtained through the usual commercial sources. They

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This work was supported by a research grant established in 1949 by Julius Hyman & Company, Denver, Colo. The coordinating committee consists of Drs. R. I. Throckmorton, E. E. Leasure, C. H. Kitzelman, A. R. Borgmann, and P. A. Dahm.

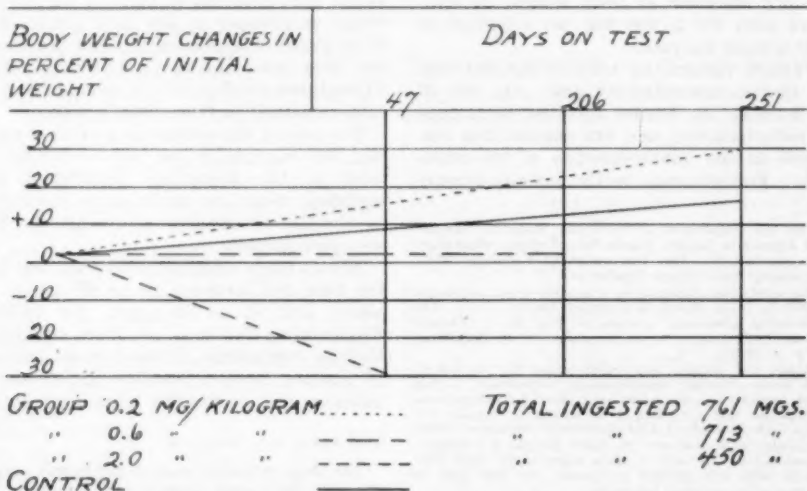
*Aldrin and dieldrin are coined names for the insecticides whose principle ingredients are respectively, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene, and 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-dimethanonaphthalene. These insecticides were developed by Julius Hyman & Company, Denver, Colo. As used in these experiments, both compounds were recrystallized to contain not less than 99 per cent of the principle ingredient.



Graph 1—Summation of long term aldrin feeding studies—group averages.

varied widely in weight and age. The range in weight extended from 8.5 to 25.0 lb. No reasonable estimate of the ages of the dogs was possible. The basic ration was dry dog food (dog checkers) supplemented with canned dog food. Examinations of the stools of the dogs were made periodically and vermifuges administered when deemed advisable.

The study was begun with 21 dogs divided at random into seven groups of 3 each. Both sexes were included in each group. This separation gave a control group and three dosage levels for both aldrin and dieldrin. The dosages employed were 0.2 mg., 0.6 mg., and 2.0 mg. per kilogram of body weight. The controls were included to estimate the variation due to environment and



Graph 2—Summation of long term dieldrin feeding studies—group averages.

food. Since the original plan proposed that the animals would be observed for a year, replacements were added as required. The results obtained are included only if the animals were on test for a significant period.

The two insecticides were dissolved in corn oil and the required quantities of 2 per cent stock solution were introduced into the center of balls of canned dog food. The animals were weighed each week and the dosage calculated accordingly. A week's supply of medicated meat balls was prepared at a time, wrapped in waxed paper, and stored in the refrigerator until used. The animals took the balls eagerly unless ill. During periods of illness, the dogs were given their dosage by means of a syringe fitted with a blunt cannula. All of the dogs on both aldrin and dieldrin dosage received their appropriate medication once daily.

RESULTS

Graphs 1 and 2 show the result of the feeding studies of the two materials.

In graph 1 it will be noted that the dogs on 0.2 mg. of aldrin per kilogram of body weight gained weight in an essentially normal fashion. Of the dogs receiving 0.6 mg. of aldrin per kilogram of body weight, 1 died from distemper, 1 was killed soon after whelping, and the third died from complications associated with whelping (necrotic endometritis). The group receiving 2.0 mg. of aldrin per kilogram of body weight lived between two and three months. The loss in body weight was greatest during the terminal period; however, as reported earlier this occurs very rapidly during the last few days of life.

It is noteworthy that the animals on the subtoxic dosage of aldrin absorbed appreciable total amounts without demonstrable clinical reactions. For example, the total amount consumed by 1 animal on the 0.6 mg./kilogram level was 923 mg. compared with the average value of 1,275 mg. producing toxic symptoms in the dogs on the 2.0 mg./kilogram dosage. Apparently, the rapidity with which the material was administered was an important factor in determining the resistance or susceptibility of the test animal.

Graph 2 depicts the similar behavior of the dogs on the dieldrin feeding studies. The animals on the 2.0 mg./kilogram level however, did not survive as long as did those on the equivalent amount of aldrin. Also, total dosages far below those given at the lower levels again proved serious. For instance, 301 mg. of dieldrin per kilo-

gram of body weight within forty-seven days at the 2.0 mg./kilogram level produced toxic reactions in 1 animal, but 1,156 mg./kilogram spread over 188 days was tolerated by another dog without apparent difficulty.

CONCLUSIONS

1) The experimental dogs receiving 0.2 and 0.6 mg. of either aldrin or dieldrin per kilogram of body weight tolerated these doses reasonably well. Their appetites remained good, the females carried their litters to term, and the animals seemed to be entirely normal.

2) No specific change was observed in the blood attributable to the insecticides fed to the dogs.

3) The comparative studies, utilizing the susceptible dog, indicates that aldrin when given in doses of 2.0 mg./kilogram of body weight is less toxic than dieldrin, if duration of life is taken as the index.

4) Aldrin and dieldrin conform fairly closely to other chlorinated hydrocarbons in their effect upon dogs.

A paper will follow shortly showing (1) the effect upon reproduction and, (2) the histopathological findings in dogs fed sublethal dose of aldrin and dieldrin.

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Livestock production in Georgia is said to have increased 430 per cent in ten years, exceeding all other states.—*Georgia Vet.*, April, 1952.

Clinical Study on the Subcutaneous Use of Calphosan

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IT IS WELL established that calcium ranks among the more important therapeutic agents we use in a large variety of conditions. It is also well known that adequate supplementation of calcium usually presents problems, particularly the mode of administration. The usual mode of administration is by the intravenous route, since subcutaneous and intramuscular injections with many prepared calcium solutions are fraught with the danger of skin damage such as sterile abscess formation, induration, necrosis, and (sometimes) sloughing.

The primary aim of this study was to determine the validity of the report that calphosan® can be given subcutaneously without undue side effects and that it produces clinical results at least equal to other calcium solutions that are limited to intravenous administration. Whether calphosan exceeds in therapeutic value the other commercial calcium solutions is a study beyond the scope of this report.

Approximately 750 cc. of calphosan, representing about 100 individual injections, was used in this series of studies on dogs and cats. Most of the injections were made subcutaneously. Several were made intravenously when the immediate need was urgent, such as in cases of eclampsia. The area generally used was the skin on the back of the neck, and the amount of each injection varied from 2 cc. in 2-week-old puppies to 30 cc. in larger dogs. The larger doses were injected with a 2-in., 20 gauge needle and disbursement was by means of slowly moving the needle under the skin. No multiple sites of injection were used.

On subcutaneous injection, the following was noted:

- 1) In no case did there seem to be pain associated with the injection.
- 2) The clinical results were equal to the results obtained from other products used in the past by other routes.
- 3) In 4 cases there occurred a swelling outlining the area of injection that began

about four days later, reached a maximum in about ten days, and then began to subside, complete resorption taking place in two to three weeks. These areas were left strictly alone.

4) There was no abscess formation, necrosis, or sloughing.

On intravenous injection, the following was noted:

1) There were no untoward side effects from this route; i.e., vomiting or skin damage.

2) The response in cases of eclampsia was as satisfactory as from intravenous injections of other products.

The following types of cases were treated:

1) Puppies, some as young as 2 weeks, were given calphosan where clinical need of calcium was indicated. Two to 5 cc. were used at one injection and repeated on alternate days for as long as ten to twenty days, using the same site. Larger puppies were given correspondingly larger doses.

2) In fracture cases, beginning about the fifth day, injections were made daily for about five days, then on alternate days for as long as two weeks. The same site was used for each injection.

3) Eclampsia cases generally were given 10 cc. intravenously (for a 20- to 30-lb dog), followed by 20 cc. subcutaneously. In the 8 cases seen during this period, none were brought back for further injections.

4) In toxemias, subcutaneous injections were given with results corresponding to other routes.

5) In posterior paraplegia, results with calphosan were no better nor worse than with other products used in the past.

6) In general cases in which calcium might have been indicated, the subcutaneous route was used with no untoward side effects.

The data submitted is intended to show that there is a product that because of the route of administration can be used promiscuously and without hesitation in all cases where calcium is indicated. Some of these cases might have to be denied calcium injections because of the damage from side

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*Calphosan was supplied by the Carlton Corporation of New York, N. Y.

effects via the intramuscular or intravenous routes required by some other products, or because of the smallness of veins and lack of sufficient muscle tissue in small puppies.

SUMMARY

Calphosan® was tested in a series of cases consisting of dogs and cats of various sizes and ages. It was found that this calcium solution can be given safely subcutaneously, intramuscularly, or intravenously without any unwanted side effects such as indurations, necrosis, or sloughing, and the clinical results were at least equal to other calcium solutions that are best limited to intravenous injection.

Aspergillosis in Turkeys

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Since the increase in production of turkey broilers in Maine, the demand for diagnostic work in this field has increased. There have been several cases of aspergillosis, 2 of which will be reported here.

Mayer and Emmet observed a lung infection with this agent in a Jay in 1815. Merchant¹ states that the pathogenic fungi *Aspergillus fumigatus* has been found in practically all species of birds, including the turkey.

Biester and Schwarte² report the incidence as not great but found in nearly all species of birds. They report that an examination of the premises or material used for feed or litter will usually reveal the source of the infection. Treatment is considered useless. Durant and Tucker³ in 1935 reported aspergillosis of wild turkeys reared in captivity. They produced the disease in a poult by feeding mash from which *A. fumigatus* was isolated. They reproduced the disease in chicks after eleven days and concluded that chicks are more resistant than turkey poults. However, aspergillosis has been reported many times in chickens but only rarely in poults. Ophthalmic aspergillosis has been observed by Moore⁴ in poults and in chicks by Reis⁵ in Brazil.

Case 1.—Five dead poults, 2½ weeks of age, from a flock of 800 were brought to the laboratory Dec. 11, 1951. The mortality had been 575 in four days. The symptoms reported were that the poults were unable to stand, sat on their hocks, and breathed

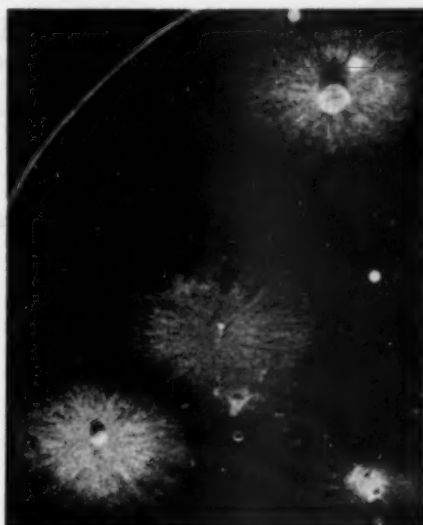


Fig. 1—Mold growing on chicken infusion agar.

rapidly. Autopsy revealed that the bones, air sacs, and intestines were normal. The lungs contained numerous white circumscribed nodules. The following day, 8 more live poults were brought in from the same

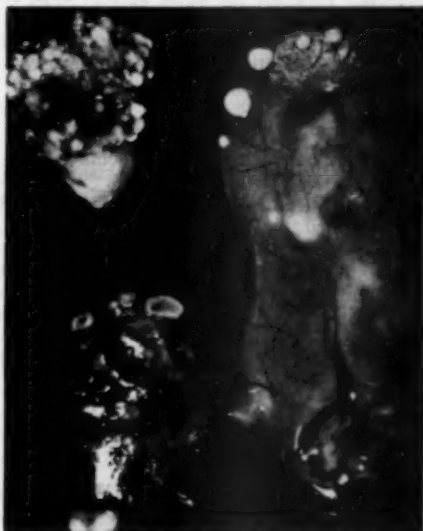


Fig. 2—Lesions on thoracic wall, heart, and intestines.

Dr. Witter is professor and Dr. Chute is associate professor, Division of Animal Pathology, University of Maine, Orono.

flock. These poult were showing severe respiratory symptoms. The brooding conditions were good. Pine sawdust was used for litter. Yellow-white nodules of the lungs similar to those in the other poult were observed, but in these birds nodules were also noted in the mesentery.

A pure culture of *A. fumigatus* taken from the nodules was grown on chicken infusion agar (fig. 1).

Case 2.—Five poult (4 alive), two weeks of age, from a flock of 1,740 were brought to the laboratory Jan. 11, 1952. The mortality had been 313. The birds appeared weak in the legs and some sneezing had been noted. Autopsy revealed that the bones were slightly rachitic. No brain lesions were observed. All Newcastle disease tests were negative. White nodules were found in the lungs and the air sacs were cloudy. A pure culture of *A. fumigatus* was isolated.

At this time, a recommendation was made to change the litter because pine sawdust was being used from the same source as in the previous case. The owner did not change the litter but added lime, and the mortality stopped.

On January 24, 6 more poult were brought to the laboratory from the same farm. The mortality had started again. Autopsy revealed the same nodular type of lesion but much more diffuse involvement of the lungs, air sacs, thoracic cavity, and even the intestines (fig. 2). Again, *A. fumigatus* was isolated.

DISCUSSION AND SUMMARY

Cases, from two farms, of poult at different ages showed aspergillosis. The mortality had been heavy. Both lots were fed a standard commercial turkey starter. Brooding and management conditions were good. After lime was added to the sawdust litter of one lot, mortality stopped temporarily. Pine sawdust from the same source was the only thing in common with both cases. It is our opinion that this litter was responsible for the condition.

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Treating Blackhead in Turkeys

A drug called "entramin" containing 22.5 per cent of amino nitrothiazole was effective in curing blackhead in turkeys. Eight sick young turkeys were given 0.05 Gm. each with a syringe daily for two days. By the third day they were brighter and eating, so entramin was added to their mash at the rate of about 0.5 per cent. In a week the birds seemed normal. An autopsy on the eleventh day revealed only shadowy outlines of the regenerating lesions in the liver. The cecums were still enlarged and filled with dry caseous material. The treatment was continued with one two-week interruption for over three months, at which time the surviving birds were in excellent condition.

Entramin (0.5 per cent) in mash was also used in a flock of 250 turkeys, in which almost 30 per cent were sick. After one week the drug was reduced by one-half and continued for three weeks. A few of the birds had to be force-fed at first but all made complete recoveries and were healthy four months later.—*Vet. Rec., Jan. 26, 1952.*

Volvulus in the Cow.—A 4-year-old cow was relieved of bloat by using a trocar. She soon bloated again but this time there was little gas in the rumen. On postmortem examination, it was found that the omasum and abomasum were greatly extended with gas and were twisted and acutely congested.—*Vet. Rec. March 15, 1952.*

The Extension Service of the U.S.D.A. states that a single application of DDT to the soil will kill certain bugs and grubs for at least five years. In several northeastern states, the average DDT carryover in the turf was as high as 92 per cent after two years, 43 per cent after four years, and 29 per cent after seven years. It seems to last longer in poor soils which contain less organic matter.

An Outbreak of Bovine Tuberculosis in Mink and Treatment with Rimifon

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Atascadero, California

IN JANUARY, 1952, a number of mink at Fur Farm Mink, Atascadero, Calif., had developed swellings and abscesses of the anterior cervical lymph glands. The infection had not responded to penicillin, streptomycin, or sulfonamide therapy. Several mink had died or were in such poor physical condition that they were pelted. Three such mink carcasses were sent to Dr. E. E. Jones, pathologist at the Livestock and Poultry Pathology Laboratory, San Gabriel, Calif., for diagnosis.

Dr. Jones reported that the mink had tuberculosis and he had inoculated a guinea pig, a rabbit, and a hen to differentiate the type of tubercle bacillus. Ten weeks later, the guinea pig died and yielded pure cultures of tubercle bacillus. The rabbit and the hen were not affected, thus identifying the bacillus as of the bovine type.

Upon receipt of the initial diagnosis, the entire herd of 750 mink were injected intradermally with mammalian tuberculin. Seventy-two hours later, none of the mink showed any reaction, not even the sick ones. This the writer can not explain. Owing to the difficulty of handling mink, other types of tuberculin testing were ruled out.

The incubation period of tuberculosis in mink is one to two months. The first symptoms observed are depigmenting of the external nares, serous nasal discharge with matting of the fur about the nose, and watering of the eyes. Anorexia and a loss of weight follows in a few days. Some mink develop swollen and abscessed anterior cervical lymph glands; also, the popliteal glands may swell and abscess. There is no coughing until the terminal stage which varies from eight days in some breeds to two months in others. The terminal symptoms are coughing of blood and a hemorrhagic diarrhea.

On autopsy, these mink have brown spots on the inner surface of the pelt, varying degrees of tuberculosis of the lungs, spleen, liver, and lymph glands. The mammary

glands and internal genitalia may be affected. Aleutian and Pastel mink are affected about 100 per cent, as they are weaker breeds. Silver Blue or Platinum, and Natural or Dark mink seem to be more resistant to tuberculosis.

During the breeding season, which is early March, it was impossible to keep from exposing all mink on the farm. About this time, Dr. Elmer Sevringhaus of Hoffmann-LaRoche, Inc., offered rimifon as a treatment for tuberculosis. On April 8, 1952, rimifon was added to the ration at the rate of 4 mg. per mink per day. There were no changes until the fifth day when their appetites improved and symptoms started to recede.

Rimifon is the Roche brand of isoniazid, chemically spoken of as isonicotiny hydrazine. It has been demonstrated by members of the Hoffmann-LaRoche staff and confirmed by others to have a marked chemotherapeutic effect on *Mycobacterium tuberculosis* in experimentally infected mice, guinea pigs, rabbits, and a monkey. It has been widely used in clinical therapy of human tuberculosis since late 1951. It appears to have no chemotherapeutic action on organisms other than the acid-fast group. Prolonged administration of low concentrations in the ration of rats had no deleterious effect upon growth, red blood cell count, hemoglobin values, or the gross appearance of tissues. The compound is rapidly absorbed from the gastrointestinal tract, widely distributed in body fluids, and excretion via the urine is usually complete within twenty-four hours after a single dose. Human dosage is based on dosages not to exceed 4 mg. per kilogram of body weight per day, with rather few exceptions, such as miliary tuberculosis, where double the dosage may be used for a few days.

Ten sick mink weighing a total of 22 lb. 10 oz. were fed rimifon for ten days, at which time they weighed 25 lb. 7 oz., a gain of 2 lb. 13 oz. or 4.5 oz. per mink. Another

Dr. Pulling is a general practitioner in Atascadero, Calif.

*Rimifon was supplied through the courtesy of Hoffmann-LaRoche, Inc., Nutley, N. J.

group of 10 weighed 31 lb. 14 oz. and after ten days of no treatment they weighed 30 lb. 11 oz., a loss of about 2 oz. per mink. Thirty-four hopeless cases were treated with rimifon and at the end of two weeks, 21 were greatly improved and 13 were dead. Of 112 sick or exposed males, 7 died in the first eleven days of treatment. From April 8 to 18, 271 mink were treated and 20 died. From April 18 to July 1, with continuous treatment with rimifon, 3 mink have died.

As rimifon seemed to relieve the symptoms and have a beneficial effect on tuberculous animals, the whole herd of 960 mink were placed on it. This treatment was continued until July 1, 1952. During this period, the females were in gestation and having their kits. The percentage of live kits and the number of conceptions were equal to the ten-year average for this establishment. The number of conceptions in extremely sick females was low. One female that had been given up as hopeless conceived on the first breeding and had 2 live kits. As of July 1, about 75 per cent of the kits showed mild symptoms of tuberculosis. They will be placed on rimifon for thirty days.

As many of these sick and treated mink will be pelted next winter, the writer will have an excellent opportunity of observing the effects of rimifon on tuberculosis. To date, it has given encouraging results and has averted a great economic loss to the owner.

Toxicity of Copper for Cows

Acute and chronic poisoning in cattle with copper was attempted experimentally (*New Zealand J. Sci. Technol.*, 27, 1946). Five grams of copper sulfate were fed daily for nine months without producing harmful effects. Yearling heifers and cows tolerated repeated doses of 20 to 40 Gm. and single doses of 100 Gm. The lethal dose lay between 200 and 400 Gm. Blood examinations were of uncertain value in diagnosing copper poisoning. The copper content of the liver was of value in diagnosing the chronic, but not always the acute, poisoning.—*Vet. Bull.*, July, 1952.

Most lizards can move each eye separately and probably have keener vision than man.—*Sci. Newsletter*, Aug. 23, 1952.

Removal of Claws in the Domestic Cat

A. G. MISENER, D.V.M.

Chicago, Illinois

Cats have long been the favorite pet of many people. In the city, they sometimes present a serious problem to the owner when the habit of sharpening their claws becomes destructive and some fine article of upholstered furniture is used as a scratching post. Recent reports by the medical profession which have appeared in the press on the danger of "cat scratch fever" have also alarmed some cat owners.

For several years in our practice, where the feline pet has become destructive, we have recommended and performed the surgical removal of the claws. This is a relatively simple surgical procedure and, we believe, a practical measure. The owner is always warned that the cat should not be allowed to live outside after this operation, as it will not be able to climb trees or defend itself against other animals.

A general anesthetic is administered, usually pentobarbital sodium, intravenously. The feet are thoroughly cleansed with a suitable antiseptic, and a tourniquet is applied proximal to the paw. An autoclaved resco nail trimmer is used to excise the extended claw at its junction with the terminal phalanx. It is important that all of the corium be excised, otherwise a rudimentary claw will regenerate in a few weeks. A sterile dressing saturated with a crystalline potassium penicillin solution is applied, and the extremity is bandaged with gauze and covered with adhesive tape. The tourniquet is then removed and the bandage left for ninety-six hours. Very little hemorrhage is encountered at the time of surgery and the cat does not seem to evidence pain during the healing process, which is usually complete at the end of the ninety-six hours.

Dr. Misener is a small animal practitioner in Chicago.

Tail Chewing in Mink.—One breeder reports that mink which chewed their tails were usually found to have enlarged, swollen anal glands. Draining these glands by an incision, or otherwise, seemed to terminate the tail chewing.—*Am. Fur Breed.*, July, 1952.

Different Forms of Swine Dysentery

G. SCHMID, Dr. Med. Vet.

Bern, Switzerland

ENTERITIS in swine must be considered to be caused by different etiological agents.

In the European literature, we find that damages by food intake are often held responsible for outbreaks of swine enteritis. However, in examining many such cases we were not able to substantiate damaging factors in the food.

This led to the idea that infective agents might be considered as etiologically important.

Wilson¹ quotes the following forms: (1) enteritis of suckling pigs; (2) enteritis caused by *Salmonella suispestifer*; (3) hemorrhagic enteritis of running pigs; (4) a mild enteritis caused by coccidiosis; (5) enteritis caused by excess of mineral salts and metallic poisons; and (6) secondary enteritis in connection, for instance, with hog cholera.

Besides these germs, including *Escherichia coli* in baby pigs, Doyle in 1921 for the first time found vibronic rods in the mucous smears of enteric bowels of pigs, but not until 1943²⁻³ was he able to point to the etiological significance of these germs and to isolate them as a pure culture from the mucous membranes.

For about three years in the Veterinary Bacteriological Institute of the University of Bern we have, following the date of Doyle, searched for these *Vibrio* organisms with success. With this statement, we call special attention to the fact that, first, this *Vibrio* is not ubiquitous, being found only in about 40 per cent of the carcasses of swine sent for diagnostic examination by veterinary practitioners. Second, the *Vibrio* has not only been found in cases of hemorrhagic enteritis but also in more or less chronic forms of diarrhea combined with eczema of the skin and also in cases of diarrhea of suckling pigs.

As evidence for the pathological action of the *Vibrio* organism, it was found mainly in the mucus of the large intestine, in fewer cases in the small intestine, and often also in the lymph nodes of the intestine.

In addition, we found *Vibrio* organisms in the edematous wall of the stomach, in the edema of the glottis, in the excretory

duct of the kidneys of 12-week-old piglets, in metastatic arthritis of 6- to 8-week-old piglets with enteritis, and sometimes in the skin.

It was instructive to isolate the *Vibrio* from the intestine of some of the fetuses removed from the uterus of a slaughtered sow with about fourteen weeks of gestation. This sow was slaughtered because she had lost her former litter because of diarrhea of the suckling pigs. Evidently, the germs are able to leave the intestinal wall of the pregnant sow and pass, by the blood stream, into the fetuses. This observation may explain that a heavy infection of the pregnant uterus can result in abortion, especially shortly before birth; it explains also the fact that the newborn pigs can fall ill on the first and second day of their life, because the pigs obviously are already infected at the time of birth.

How is the injurious effect of the *Vibrio* organisms to be understood? As soon as the organisms have multiplied to a certain point, we observe alteration of the wall of the intestine with slight to heavy edematous swelling or inflammation. In both cases, the resorption of feedstuffs is reduced, as is that of the vitamins, especially those of the B group including the aneurin-containing co-carboxylase.

Some symptoms of disease observed (*i. e.*, gut edema, edematous swelling of the eyelids, edema of different organs) often indicate that there has taken place a general acidosis engendered probably by an accumulation of acids of the intermediate metabolism, especially pyruvic acid, which is a very toxic product.

As the administration of thiamine in large doses is expensive and does not stamp out the causative agent, it was thought to check the *Vibrio* infection by medicaments in order to allow a return to normal resorption of the feedstuffs.

Prior to our experimental work with pigs, we examined about 40 substances with respect to their bacteriostatic action against this *Vibrio*.

Sterile slips of paper were imbued with the respective solutions and placed on the

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blood-agar plate for sixteen hours, allowing the substance to penetrate into the blood agar. Then the plates were inoculated with the organism in vertical stripes on the paper and incubated in CO₂ at 37 C. for twenty-four to forty-eight hours. After this, the extent of the checked zone without growth could be measured.

Some of the results are as follows:

Solution	extent of the checked zone
Sulfapyridine-Na 1% —	50 mm.
Sulfapyridine Na 0.1% —	0 mm.
Blue of methylene 0.1% —	0 mm.
Penicillin 1% —	60 mm.
Creolin 1% —	0 mm.
Sulfamethazine-Na 1% —	63 mm.
0.1% —	10 mm.
Succinyl-Sulfanilamide 1% —	0 mm.
Rivanol (aethoxydiamino- acridinlactate) 1% —	0 mm.
Phenothiazine 1% —	0 mm.
Vibriogreen 0.01% —	8-14 mm.
0.005% —	7-10 mm.
0.002% —	0-5 mm.

Experiences in veterinary practice have shown that subcutaneous injection of diazil often is helpful.⁴ The therapeutic effect, however, is limited because rapid excretion takes place. Besides this drug, we have tried to influence the damaged intestine by oral administration of vibriogreen[®] by mixing it with the beverage. For suckling piglets, the medicament is combined with vitamins of the B group and given in form of a paste rubbed on the tongue or the palate.

THERAPEUTIC EXPERIENCES

a) *With Running Pigs.*—Case 1.—Six, 70-lb. pigs were scrubby, thin, and had a poor appetite.

Treatment.—During five days before feeding they were given 1 qt. of skimmilk per pig in which was dissolved one tablet of vibriogreen. Three weeks later, the owner said that the appetite of the pigs improved after the third day of treatment and they were making a good recovery within the 2 to 3 weeks.

Case 2.—In each of two pigsties there were 6 pigs, weighing about 100 lb., with poor appetites and yellow-brown diarrhea. For several weeks, there had been little or no gain in weight. The pigs in pigsty 1 were treated and the others served as controls.

⁴Chinone-acridine combination.

Treatment.—On five consecutive days, every pig in pigsty 1 received daily 1 qt. of vibriogreen solution with skimmilk as a beverage. Two to three days after the beginning of the treatment, the pigs' appetites returned. A week later, a better appearance and a gain in weight could be noticed. In the control group, nothing had changed in this time.

A veterinary practitioner writes as follows:

With both vibriogreen and vibriogreen paste I have had good experiences with healing effects in cases that in earlier times I have judged as hopeless.

In piglets and pigs of 40 to 60 lb. affected with dysentery it was my experience that improvement was more certain if after a treatment of five to eight days a second treatment of the same duration was repeated after a cessation of one week.

With pigs in poor condition or with loss of appetite at the beginning of the treatment, good success has been observed in combining the administration of vibriogreen with an injection of diazil and erysipelas serum.

My own observations as well as reports that have been sent to me by owners indicate that the treated animals subsequently gained very good weight.

For suckling pigs with white and yellow diarrhea, this medicament was given as a paste by rubbing it on the tongue or on the palate.

b) *Experiences with Suckling Pigs.*—(1) Ten 14-day-old suckling pigs suffered with white diarrhea and showed lack of a desire to nurse.

Treatment.—On four consecutive days, each of the animals received a piece of paste the size of a pea rubbed on the tongue and the palate by means of a tongue depressor. Within 2 days the appetite returned and diarrhea ceased. Ten days later, 2 piglets showed a relapse but recovered when the treatment was repeated for two days.

2) A litter of 12 piglets became ill with diarrhea when 5 days old. They were treated in the above manner for four days. We noted beginning convalescence from the second day of medication.

The same veterinarian as above cited writes:

The paste is a good medicament for suckling pigs that have diarrhea. My observation is that a double dose should be given the first two days of treatment.

With these observations, I would say that those two medicaments are indispensable in future.

Prevention.—We recommend that fattening hogs receive vibriogreen, for preventive purposes, the first four weeks after purchase of new animals, for three consecutive days every week.

Diarrhea was prevented in suckling pigs by giving vibriogreen to the sow after delivery or by giving the paste to the suckling pigs a few days prior to the time when diarrhea ordinarily sets in.

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Terramycin Checks Calf Infections

I. A. SCHIPPER, D.V.M.

St. Paul, Minnesota

In the past year, we encountered infrequent respiratory and enteric infections in calves that did not respond to formerly approved methods of therapy, so a new approach was necessary. Intramuscular administration of terramycin* was employed in 16 cases involving 22 calves of various ages. Sterile water was the diluent (20 cc./500 mg. of terramycin) in all cases. All administrations were made deep into the thigh region. Two dosages were used, 500 mg. and 1 Gm. Three typical case histories are presented.

Case A.—A Holstein-Friesian calf, 3 weeks old, exhibited thin watery feces, dehydration, and mild dyspnea, with a temperature of 102.8 F. Five hundred milli-

grams of terramycin was administered intramuscularly. The calf appeared normal three days after treatment.

Case TR.—Six Holstein-Friesian calves, from 3 weeks to 2 months old, had temperatures of 104.2 F. to 106.0 F. Symptoms included anorexia, a persistent cough, extensive nasal discharge, dyspnea, and acute diarrhea with fetid watery feces. Four other animals were housed in the same pen as the 6 sick animals. All calves in the pen were vaccinated with bovine bacterin No. 2, and all sick animals received 500 mg. of terramycin intramuscularly. Within one week, all appeared normal except for the persistent cough and a mild anorexia which remained with 1 calf. Sodium acetate (2 oz. per day) was given to this calf for two weeks and it appeared entirely well one month after initial treatment.

Case FF.—A 3-month-old Holstein-Friesian calf exhibited a temperature of 104.4 F., excessive nasal secretion, dehydration, fetid watery feces, and anorexia; also some coughing and hyperpnea. Treatment consisted of 1 Gm. of terramycin intramuscularly, which was repeated in twenty-four hours. Some improvement was noted within the first twenty-four hours, and in five days the feces were of normal consistency and the calf was eating well.

All additional cases responded equally well to intramuscular terramycin. Most of the cases treated with 1 Gm. of terramycin might have responded equally well with 500-mg. administrations of this antibiotic. The calves involved were of valuable breeding stock so the object was a successful therapy rather than to determine practical dosages.

Contagious Ecthyma Infection in Man.

In Australia, 23 of 46 attempts to transmit contagious ovine ecthyma to man were successful. The lesions produced were severe in 14 cases and mild or doubtful in 9 cases. The incubation period was from four to six days; the lesions reached their maximum in about twenty-one days and were usually healed by the twenty-eighth day. No constitutional disturbances were noted. Clinically, the lesions resembled those in sheep. In several cases the infection was retransmitted from man to sheep. A solid immunity apparently followed such infections in man.—*Vet. Bull., Aug., 1952.*

Dr. Schipper is a research fellow at the University of Minnesota, St. Paul.

*The terramycin employed in this work was furnished by Chas. Pfizer and Co., Inc., Brooklyn, N. Y.

A Preliminary Report on the Etiology of Edema of Newborn Pigs

GEORGE A. YOUNG, D.V.M.

Austin, Minnesota

IN A RECENT article, Pinkerton¹ described a malady among newborn pigs characterized by excessive amounts of fluid in the pleural and peritoneal cavities, general but variable edema, and general malformations. He gave no explanation of the causes. Similar abnormalities were observed in our herd (Hormel Foundation) during March, 1952, and were apparently associated with the injection of pregnant gilts and sows during early gestation with attenuated hog cholera virus. A preliminary report on the malady was delayed until the condition could be reproduced experimentally.

at different stages of pregnancy. Data from 7 additional dams which were vaccinated with only B.T.V. were included as controls.

None of the gilts or sows showed any apparent effects of vaccination. However, the gilts that farrowed three months after the vaccination showed an extremely high incidence of stillborn and abnormal pigs. The most obvious malformation was ascites, or "potbellies", in terms used by the herdsman. Other abnormalities were small ears, deformed noses, distended surface vessels, purpura-like skin lesions, and edema of the body and legs. Recognizable fetuses which



Fig. 1 — Newborn pig showing ascites and edema. Pig was born alive but died within an hour.

FIELD OBSERVATION

Sixty-five outbred Chester White gilts and sows previously vaccinated two to four times for hog cholera with B.T.V. (Boyn-ton's tissue vaccine) were again vaccinated with attenuated hog cholera virus vaccine without serum. Some of these females were open, but the majority of them were

had died were included as stillborn pigs. A picture of a typical "pot-bellied" pig is shown in figure 1.

On autopsy, the most obvious abnormal finding was increased pleural, and especially peritoneal, fluid. The liver was usually mottled in color and pitted and irregular on the surface (fig. 2). Some pitting was also noted in the kidneys.

Data from all litters were compiled in an attempt to determine the cause of the abnormalities (table 1). The performance of the 7 gilts and sows which were not injected with live attenuated virus served as a standard of normal performance for the group. It is interesting to note that the dams injected with the live attenuated virus eight or more days before breed-

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Hormel Institute publication No. 82 and paper No. 2910, Scientific Journal Series, Minnesota Agricultural Experiment Station. This work was aided by a grant from Lederle Laboratories Division of the American Cyanamid Company, Pearl River, N. Y.

The author thanks Drs. L. E. Carpenter and H. S. Teague for permitting him to include data from litters used in their experimental program.

ing (which would allow time for host-neutralization of the virus) conformed to the standard of performance demonstrated by the nontreated group.

All abnormal pigs occurred in litters from gilts and sows which received attenuated hog cholera virus during the first thirty days of gestation. A marked increase in stillbirths and in neonatal mortalities was also evident in litters from these dams. Fetal deaths were most common in fetuses forty to seventy days after breeding. These were quite well distributed throughout the litters as indicated in table 2. Only one of the 13 litters, that of an older sow, escaped having abnormal and stillborn pigs. She weaned 10 of the 12 pigs farrowed. Also, all except 1 of the 22 pigs in this group which were weaned were nursed by older sows.

EXPERIMENTAL

To elucidate the specific nature of the malformation and stillbirths caused by injection of attenuated hog cholera virus obviously requires pooling of technical skills. To meet this requirement, a co-operative program has been in effect for the past four months. The leading active participants are Drs. Ralph L. Kitchell and Jay H. Sautter of the departments of anatomy and pathology, School of Veterinary Medicine, University of Minnesota, and the author. Such other skilled individuals as seem necessary will be brought into the program as it progresses.

The data presented in table 2 have served as a guide to timing in experiments designed to reproduce the condition. Thus far, 21 litters have been examined in controlled scientific experiments. Injections of attenuated hog cholera virus have been made fourteen to sixteen days after breeding in nonimmune, B.T.V.-immunized, serum-virus immunized, and attenuated virus-immunized dams. The condition has definitely been reproduced on injection of nonimmune dams with attenuated hog cholera virus. Data are not yet available on B.T.V.-immunized dams. At present, data are

insufficient to clearly evaluate the effect of injecting dams previously immunized with serum-virus or attenuated virus. A full report of these findings will be made as soon as practicable.

DISCUSSION

The occurrence of abnormal pigs in litters from dams injected with attenuated hog cholera virus should not be entirely

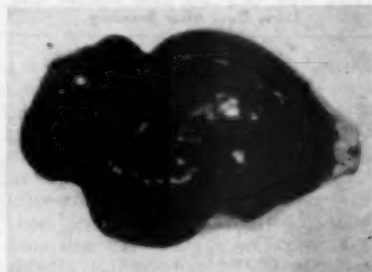


Fig. 2.—Liver from pig shown in figure 1. Mottling and pitting of the liver was a characteristic lesion.

unexpected. There is good evidence that virus infections which attack the mother in the first third of the gestation period adversely affect the developing young. This has been reported, for example, for influenza in swine,² for rubella (German measles) in man, first by Gregg³ and later by more than 20 other workers,⁴ and for experimental poliomyelitis in mice.^{5,6} The abnormalities occur during the stages of rapid development of the embryo and before the placentas are completely attached. Therefore, the differences in placentas would have negligible influence on the developing embryos.

The fact that attenuated hog cholera viruses can produce malformed pigs should not be interpreted as condemnation of the

TABLE 1.—Performance of Gilts and Sows Injected with Attenuated Hog Cholera Virus at Different Stages of Gestation

Treatment	No. of litters	No. born alive	No. born dead	Still-born (%)	Pigs weaned	
					(No.)	(%)
None (B.T.V. previous to breeding)	7	62	1	1.6	48	77.4
Injected with attenuated hog cholera virus:						
60 or more days after breeding	17	150	3	2.0	97	64.7
30 to 60 days after breeding	13	119	5	3.7	62	52.1
0 to 30 days after breeding	13	52	59*	53.2	22	42.3
1 to 7 days before breeding	8	59	1	1.7	34	57.6
8 or more days before breeding	14	124	2	1.6	95	76.6

*This figure includes all recognizable fetuses passed by the dams. Estimated age of early deaths based on skeletal size: 40 to 70 days.

newer hog cholera vaccines. It merely points to one limitation of otherwise very useful biological products. Since use of such products in pregnant animals would not ordinarily occur, the problem is not actually a serious one. If, in an outbreak of hog cholera, it becomes necessary to im-

into the dam during the first thirty days of pregnancy. The condition described has been reproduced in controlled experiments by injection of attenuated hog cholera virus into nonimmune sows fourteen to sixteen days after breeding.

TABLE 2—Effect of Attenuated Hog Cholera Virus on Litters from Gilts and Sows Injected One to Thirty Days After Breeding

Age of dam at farrow (months)	Days of gestation	Age of embryos at time of injection (days)	Pigs born alive	Grossly abnormal live pigs	Pigs born dead	Pigs weaned
16	115	2	2	0	5	0
11	120	5	0	0	8	0
21	116	7	12	0	0	10
12	115	7	2	2	4	0
23	114	7	5	1	10	4
23	115	10	4	1	3	2
23	114	10	4	1	5	2
10	115	10	2	2	3	0
21	115	18	5	4	5	0
11	121	21	1	1	6	0
23	118	21	8	2	0	3
11	115	22	0	0	10	0
13	114	28	7	2	0	1

mune pregnant sows, it should be recognized that malformed pigs may result from sows vaccinated during the first thirty days of gestation. Since the pig crop from such sows is likely to be disappointing, it might be more economical to market the sows within a reasonable time after vaccination.

The condition of newborn pigs reported here has been produced by two attenuated hog cholera viruses with distinctly different backgrounds of origin. Since the difficulties they produce can be effected only in such a limited period, i.e., the first thirty days of gestation, perhaps the effect of serum-virus vaccination of pregnant sows should be reevaluated. No doubt there are good data which could be used for this reevaluation. In any case, fourteen- to sixteen-day challenge with serum and virus in pregnant sows will be included in the program mentioned under "experimental" in this paper.

SUMMARY

A report is made on a malady of newborn pigs characterized mainly by increased pleural and peritoneal fluids with local or general edema. From the data available, the condition appears to be associated with injection of attenuated hog cholera virus

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Erysipelas in Lambs

Henderson reports (Canad. J. Comp. Med., July, 1952) that arthritis in lambs, associated with *Erysipelothrix rhusiopathiae*, has been reported in Europe, Australia, New Zealand, and the United States but never before in Canada. In October, 1951, 4 lambs about 6 months old had died and 3 others were lame in a flock of Southdowns. The affected lambs had swollen hocks or fetlocks, would scarcely rise or walk, ate little, and had temperatures of 105 and 106 F. The previous cases had all died after being affected two to four weeks.

Autopsy of 1 lamb revealed no lesions except inflammation in the affected joints. Cultures from these joints produced erysipelas organisms. The 2 remaining affected lambs had been lame about two weeks. Each was given a single intramuscular injection of 450,000 units of procaine penicillin in oil. The next morning their temperatures had dropped 2 degrees and they were normal on the second day; the lambs showed a marked improvement. In two weeks they apparently had fully recovered.

NUTRITION

Experimental Feeding of Senecio Silage to Calves

P. H. VARDIMAN, D.V.M.

Marfa, Texas

IT HAS BEEN well established by Mathews¹ that *Senecio riddellii*, as it grows in this area [West Texas] is toxic. Toxicity of this plant also has been shown in Nebraska,² along with other species of *Senecio* in Cape Colony by Robertson.³ No attempt will be made in this article to review all the literature on poisoning due to *Senecio* spp., since Mathews' bulletin gives a good review.

Losses of cattle from *Senecio* poisoning in this area are high. During some seasons, fatalities have been as high as 12 per cent of an entire breeding herd, and almost every ranch experiences a loss of 5 to 10 cows annually. The losses are enzootic and are so insidious that ranchmen are prone to accept and overlook this taxing of their investments. Losses run higher on land which is, and has been, badly overstocked.

PRELIMINARY WORK

During 1950 to 1951, 2 normal heifer yearlings were fed silage made from *Senecio riddellii*. No facilities were available at the Animal Disease Investigations Laboratory for making this silage, so an 18-in. pipe was used. These 2 animals were fed 30 per cent of their body weight of this silage during a two-month period (fig. 1). Since bromsulphalein liver-function tests indicated that there was no damage to the livers of these animals, and no symptoms appeared during the next eight to ten months, the following experiment was set up to determine the toxicity of *Senecio* silage for cattle.

Toxicity of the green plants was established during the fall of 1951 by force feeding 2 animals on the green plants at the time the silo was being filled. One

died within six weeks following consumption of the last green plants. This animal had received 15 per cent of its body weight of green *Senecio* (calf 143). A balling gun was used to administer the ground plants at the rate of 1 per cent of the body weight per day. The animals were at all times fed alfalfa hay and were running on blue gramma pasture. The other calf on this experiment (calf 147) died seven weeks after consumption of 12 per cent of its body weight of the same green plants. Symptoms of poisoning and lesions were typical for the chronic form of poisoning in these animals. Thus, it was shown that plants grown during late summer of 1951 were toxic in the green state.

EXPERIMENTAL PROCEDURES

An experimental silo was constructed of concrete well rings set on top of each other and mounted on a concrete base. Over this was suspended a gin pole and wench with which to remove and handle the concrete rings. These rings were lined with heavy building paper and filled with the green *Senecio riddellii* plants as they came from the silage cutter. A mixture of 1/3 blackstrap molasses, by volume, and 2/3 water was added to this green mass until it was thoroughly wet. The green material was tramped thoroughly as it was added to the silo and the rings were added as the mixture was filled in. After two weeks, the mass had settled so that a new batch of the green plants was harvested, chopped, and the silo refilled. Filling of the silo was completed Sept. 22, 1951.

Ten small Hereford calves were purchased locally for this experiment — 5 heifers and 5 steers. The entire group was approximately the same size. None of the animals varied more than 30 lb. in weight from the others. Each animal was eating well and was tractable, so that we felt they would be good for our purposes.

During the first two weeks, these calves were placed on the basal ration, which consisted of ground hegari, alfalfa, and cottonseed meal, in

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Fig. 1—Two-year-old heifers were fed 30 per cent of their body weight of Senecio silage when they were yearlings. These animals are still normal.



Fig. 2—Calves in pen 12 were force-fed 110 per cent of their body weight of Senecio silage during the experiment. This picture was taken one month after the experiment was completed.



Fig. 3—Calves in pen 41 were fed 113.6 per cent of their body weight of Senecio silage mixed in their feed during the experiment. This picture was taken one month after the experiment was completed.

order to adapt them to the new ration. During that time, they were ear-tagged and vaccinated for blackleg. They also were sprayed with 3 per cent DDT solution to kill lice. On Jan. 3, 1952, these animals were penned into lots of 2 (a steer and a heifer in each pen), weighed, and started on the basal ration. The approximate intake of the basal ration had been determined during the previous two weeks. This figure for each calf was tentatively divided so that in pen 12 the calves received two-thirds as much of the basal ration as the control animals, and one-third, by weight, of Senecio silage was administered with a balling gun each day (calves 162 and 163). The same amount was given to calves 160 and 161 in pen 41, but the silage was mixed with the other feeds in the basal ration. This procedure was followed throughout this experiment with a few changes being made in the various proportions of feeds in several instances.

On Jan. 5, 1952, liver biopsies were taken from each calf with a hepatic trochar. These tissues were sectioned and examined microscopically. Liver biopsies were taken at the end of the first month (February 2) and again at the end of the second month (March 1) to determine possible liver damage. On May 12, a month after the calves received their last silage, biopsies were again taken. The calves in pens 11, 21, and 31 were fed the basal ration in the same quantities as that given to animals being fed Senecio, but did not receive Senecio silage. This ration was ground together with a hammer mill and consisted of matured bundle hegar, alfalfa hay, and cottonseed meal.

RESULTS

Table 1 shows the number of pounds gained in each lot of calves, amount of silage consumed, and percentage of body weight of silage consumed. There was no appreciable difference in rates of gain in the various pens, which indicated that the Senecio silage had not interfered with gains in weight. None of these animals showed any symptoms of disease at any time during the experiment. At the end of the first month of the experiment, we observed that the animals which were consuming silage were not eating as much salt. After that date, the salt which was placed in the boxes free choice was weighed (table 1).

After observing that the calves consuming silage were not taking as much salt as the other calves, a sample of the silage was sent to the Trinity Testing Laboratories at San Antonio for an analysis of the mineral content of the silage (table 2). The test showed the silage to contain about 2 per cent sodium chloride, which probably

explains why animals consuming silage did not eat as much salt.

During 1950-1951, a sample of silage was analyzed for common food nutrients by J. F. Fudge, state chemist (Texas). A similar sample was examined by him in 1952. Results of the two analyses are shown in table 3.

TABLE 1 — Results of Senecio Silage Feeding Experiment (2 Calves in Each Pen)

	Pen 12	Pen 11	Pen 21	Pen 31	Pen 41
Starting weights, 1-5-52	315	305	315	340	285
Weights, 4-6-52	550	540	560	610	570
Total weight gains	235	235	245	270	285
Percentage* body weight Senecio fed	110%	0	0	0	113.6%
Total pounds Senecio consumed	455	0	0	0	455
Total pounds salt consumed	9	17	21	21	9
(Pen 12 force fed with balling gun — pen 41 fed free choice)					

*Percentage of body weight of silage taken was computed on basis of accrued weight at each weight period. These animals were weighed once each month.

Results from this year's feeding trial do not indicate clearly whether the food nutrients shown in table 3 can be digested and assimilated by cattle, but we hope to run further experiments to determine the feeding value of this silage. It is apparent

TABLE 2 — Chemical Analysis — March 7, 1952

Calcium (Ca)	0.69%	Potassium (K)	0.29
Phosphorus (P)	0.11	Sodium (Na)	1.35
Iron (Fe)	0.007	Chloride (Cl)	0.85
Note: Total moisture content of this silage was 72%; total ash determination 6.5%.			

from our experience in feeding this material that the animals will take the silage readily when it is mixed with other feeds. It seems to have no detrimental effects but is not very palatable. The animals in pens 12 and 41, which received Senecio silage, did not show any abnormalities at any time. They were still normal in May, 1952, and gaining well (fig. 2, 3). We believe that animals can be induced to eat a ration consisting of 50 per cent Senecio silage by weight when it is mixed in the basal ration as used in this experiment, and it may be possible to gradually change the ration so that the animals eventually eat Senecio silage alone.

DISCUSSION

The fermentation process which occurs during formation of the silage made from *Senecio riddellii* apparently destroys the toxic substance in the green plants. Tremendous amounts of the plant were not harmful when fed to calves by force methods and by mixing it with other feeds. Liver biopsies were taken with hepatic trochar and examined microscopically. No microscopic lesions were found. All showed normal livers.

TABLE 3 — Chemical Analyses of Senecio Silage, 1950-1951 and 1952

	1950-1951	1952
Protein	3.97	7.59
Fat	2.31	1.38
Crude fiber	10.83	11.78
Nitrogen free extract	15.65	8.65
Water	62.50	65.43
Ash	4.74	7.17

It is hoped that if silage can be made in this way, and it proves to be a valuable feed, that these poisonous plants can be removed from heavily infested areas on the range. If harvested while in full bloom, the source of seed can be removed and thus reduce future plant stands. Further research to adapt mechanical equipment to harvest the green plants should be done. Work should also be done to establish the feeding value of such silage.

SUMMARY

- 1) Edible silage can be made from *Senecio riddellii*.
- 2) Such silage is nontoxic to calves.
- 3) Blackstrap molasses must be added to the green, chopped plants to insure formation of silage.
- 4) Animals fed on this silage do not eat as much salt as those receiving the same feed without the silage. This is assumed to be due to the presence of considerable quantities of sodium chloride in the silage along with other minerals.

It is postulated that this high salt and mineral content of *Senecio riddellii* plants may cause cattle to eat these poisonous plants on the range. The feeding of loose salt and mineral mixtures under such conditions, therefore, is recommended.

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Over-Ripe Hay and Grasses Not Digestible

Ruminants can digest over 90 per cent of the cellulose in feed but they can not digest lignin, the hard woody fiber in over-ripe hay and grasses. Cows will readily eat black, weather-tarnished alfalfa hay in preference to green leafy hay if the former was cut in the bud stage, the latter in the flower stage when lignin had developed. Likewise, young grass is much more palatable and nutritious for grazing than when it is more mature. The microorganisms in the rumen convert the fiber into fatty acids: about 70 per cent acetic acid, 20 per cent propionic acid, and 10 per cent butyric acid.—*Certified Milk, July, 1952.*

Vitamin A Storage.—Livers taken at public abattoirs from 657 cows from September, 1945, to June, 1949, were analyzed for carotene and vitamin A. A marked seasonal variation was evident, with the maximum vitamin A reserves occurring in November and December when the cows are starting on winter rations; the minimum occurred in April and May about the time the cows went to pasture.—*J. Comp. Path. and Therap., July, 1952.*

Influence of Tocopherol on Vitamin A

There are indications that a correlation exists between tocopherol (associated with vitamin E) and carotene (pro-vitamin A). A study at the University of New Zealand revealed that pastures of rye grass and clover contain three or four times as much carotene as should be required to produce milk with a vitamin A potency of 2,000 I.U. per pound. In spite of this, the milk contained only 1,200 I.U. per pound.

Three pairs of monozygotic twin cows were therefore placed on such a pasture until their milk potency dropped to 1,200 I.U. Then 1 of each pair was given 1 Gm.

of alpha-tocopherol daily for fourteen days. The vitamin A potency of these cows started to rise in two days and reached the maximum of 2,000 I.U. in eight days. The control cows continued at about 1,000 to 1,200 I.U. Increasing the tocopherol to 3 Gm. per cow per day or feeding added carotene concentrate daily had no advantage over the 1 Gm. of tocopherol alone.

It had been assumed that ordinary rations, particularly fresh green forage, would supply all the tocopherol which cattle required. This finding may partially explain why vitamin E deficiency (white muscle disease) occasionally occurs in young calves and lambs.—*Nutr. Rev., Sept., 1952.*

Ladino Pasture for Hogs.—Purdue University reports that good pasture will provide much of the protein required to put hogs on the market. The average of 50 experiments indicated that pigs on legume pasture required 25 per cent less protein than those on drylots. From birth to 100 lb., they can get along without protein if they are on such pastures.

Shoats on alfalfa pasture, corn, and no supplement gained 1.48 lb. per day; on Ladino clover, corn, and no supplement, 1.61 lb. per day; on alfalfa, corn, and protein supplement, 1.64 lb. per day; on Ladino clover, corn, and supplement, 1.8 lb. per day.

When a raw soybean diet was fed to calves, it produced a significantly lower plasma vitamin A and carotene content.—*Borden's Rev. Nutr. Res., June, 1952.*

Silage made from high-protein corn may reduce protein costs for cattle. One high-protein variety, started in 1896 at the Illinois Experiment Station, produced silage with 3 per cent protein whereas a high-protein hybrid silage had 2.8 per cent and a low-protein hybrid silage only 1.8 per cent. However, when raised on poor soil, especially a soil low in nitrogen, the above differences in protein content tend to disappear.—*Successful Farming, Feb., 1952.*

EDITORIAL

"Can We Stamp Out Disease?"

The following article under the above title by Mr. J. K. MacClarren, head of the Information Division of the U. S. Bureau of Animal Industry, is so readable and states so well many of the things that the JOURNAL would like to say editorially about disease control that, even though we do not fully agree with every detail, we consider it worthy of reprinting. We, therefore, secured permission from the *Farm Journal* to quote it verbatim. We hope our readers will give it serious thought.

A farmer on Manhattan, whose dairy cattle grazed where New York skyscrapers now stand, bought a real bargain cow one fine day in 1843. He got her off an English ship—the dampness of the sea had made her sick, the captain said.

You don't hear much about that animal any more, but she started more trouble than Mrs. O'Leary's cow—the one that is supposed to have touched off the big Chicago fire.

That "sea-sick" cow brought in pleuro-pneumonia, one of the worst livestock disease plagues ever turned loose in this country. It looked like suicide for the livestock business—until a bill went through Congress to create a Federal Bureau of Animal Industry to stop pleuro-pneumonia. The new bureau did just that—wiped out the plague completely, and then went on to tackle other diseases.

That successful campaign laid the philosophy for our American attitude toward livestock disease: *don't live with a disease that you can wipe out.*

That feeling drove us to stop tick fever, glanders, dourine, TB, fowl plague; and we have slapped down foot-and-mouth six times. Now we're after brucellosis, and many feel that even before we back that disease off the map we will have whipped hog cholera.

We're working back toward the good old days when Indians and buffalo roamed our prairies, and when very few of our present diseases were here. We imported most of our troubles: scab, mange, blackleg, pink eye, erysipelas, lock jaw, anaplasmosis, worms, even flies, and many others.

Just five years after the first *Farm Journal* was lifted off the press in Philadelphia, the first horn fly was spotted about 30 miles away in New Jersey. What a shame someone didn't swat it! In less than 10 years, millions of them were living off the blood of cattle all across the country. We haven't whipped the pesky little horn flies yet; we don't know how.

Without research we stumble along in the dark. In the past we've split cows' tails and stuffed in salt and pepper, to cure "hollow tail"—a disease that really never existed. We've fed wood ashes and turpentine to hogs to "cure" cholera. We've kept goats in dairy herds to keep brucellosis away. We've done equally worthless things just because we didn't know any better.

We didn't know that sanitation was so important—that it would prevent worms in hogs, for example—until 17 farmers tried raising hogs on clean ground in McLean County, Illinois, in 1919. They kept records for six years, and marketed two more pigs per litter than their neighbors. The McLean County clean ground system soon became famous, and still is. It helped show us that *disease management is an important part of every-day farming.*

While all this was going on, farmers were deciding that disease on a neighbor's farm is your own problem, too. One diseased farm can infect a whole neighborhood, and that neighborhood can infect a state and a nation. Remember the bargain cow!

Disease, then, is a community problem that requires community co-operation by farmers. And farmers are getting ahead of more and more diseases. With the help of well-trained veterinarians we'll whip the important livestock diseases some day.

Farm Journal says we may do this:

1. Maybe we'll pay veterinarians to keep our farms free of disease, instead of waiting until our livestock get sick. We may even stop paying—as the Chinese do—when disease hits. Veterinarians may "go farther" by turning over to trained technicians such routine jobs as jabbing livestock with vaccinating needles, taking blood samples.
2. Some day we'll come up with a virus cure—something we don't have today. The new \$10 million Federal virus laboratory, urged by *Farm Journal*, will be one of our greatest steps in that direction.
3. We'll remake the poultry industry. The chicks from several firms that are sometimes hauled on one express truck at a rail station are possible spreaders of diseases from 3,000 to 5,000 flocks of hens.
4. We'll tighten up on sales barns, trucks, stockyards, livestock dealers, and other sources that are sometimes "cesspools" of disease.
5. Farmers will demand more and more that breeding stock carry disease-free certificates when offered for sale. Purebred organizations may

take the lead by requiring these certificates on all purebreds sold.

6. State veterinarians and disease inspectors will be taken out of politics, so that they can give the best service to farmers without playing favorites or being afraid of political pressures.

7. Each case of a disease on a farm will be reported to the state, then to a national center, so that we will know exactly where we stand on each disease—instead of being in the dark as we are today.

Let's hope the day is not far off.

Cornstalk Poisoning

Livestock disease problems vary with the seasons and the climate, partly due to the changes this brings in available feeds. Except in the southern states, November is about the end of the pasture and roughage grazing season. Although in recent years no disease of farm animals has been especially prominent in November, we are not so far from the 1930 decade when cornstalk disease of cattle and moldy corn poisoning of horses were frequent and invariable killers. Few, if any, cases have occurred since then, but they might if similar weather conditions should develop.

These two diseases should not be confused. They were not related. They seldom, if ever, occurred in the same fields and often not in the same season. Both were definitely the result of poisoning.

The horse disease was rare and readily confused with severe encephalitis. It apparently resulted from a toxin in moldy ear corn that actually caused a liquefaction of the brain tissues in horses only.

The affected animals soon became stupid and blind and would push over or through obstacles, or they became paralyzed. In either case they would usually die in twenty-four to forty-eight hours. Several cases were seen in 1937 when many fields of corn did not mature and the "nubbin" ears became moldy.

On the other hand, cornstalk disease in cattle was more prevalent in the drouth years of 1933 to 1936, with the incidence then decreasing and few, if any, cases since 1941. The poison was apparently in the stalk, especially in stunted or replanted corn where the frost caught the plants while they were still immature.

This disease seemed never to develop in fields harvested by mechanical corn pickers and when such machines became almost

universally used, the disease vanished. Perhaps the crushing or breaking of the stalk allowed faster drying or in some way avoided or shortened the chemical phase in which toxins were formed. However, this may have been only a coincidence and different weather conditions or different varieties of corn may have been the reason for the disappearance of the disease. Much open pollinated corn was raised in the 1930's, but the hybrid varieties have "taken over" almost entirely since then.

Usually, only 1 to 3 young animals in a herd would be affected, but in one instance 17 in a herd of 40 died in about twenty-four hours. Of 87 cases seen in 52 herds in the five years—1933 to 1937 inclusive—100 per cent died. All were affected between October 15 and December 7 of those years, with 60 per cent being in November. The disease usually occurred about a week or ten days after the cattle were turned into the stalk field and would stop within a day after their removal.

Probably 95 per cent of the affected cattle were under 2 years of age but occasionally mature cows would die. Most cases would stagger, stare, become either dumb or frantic, then develop coma and die. Their temperatures were never found above normal; often they were subnormal.

Upon autopsy, three pathological changes usually were quite evident: (1) petechial and ecchymotic hemorrhages widely distributed but especially frequent in the thymus gland and on the heart; (2) a bluish, slightly swollen liver; and (3) an amber-colored edema around, and in the wall of, the gall bladder.

In 1935, experimental treatment resulted in the temporary recovery of several cases but always they would relapse and die in a few hours. Animals in a coma, when given about 250 to 500 cc. of 20 per cent dextrose solution, intravenously, would often get up and act normal for a few hours, then relapse. Each re-treatment would bring a weaker response and death never was postponed more than a few hours.

This disease had usually been diagnosed and treated as hemorrhagic septicemia. The nervous symptoms and the hemorrhagic lesions were quite classical. Specific vaccines usually produced excellent results—unless the animals were returned to the field before the toxic phase in the stalks had passed. However, temperatures were

never high and cultures were usually sterile. The temporary recoveries resulting from dextrose treatment were the final proof that this disease was not infectious.

Little research was ever done with the disease and if the causative agent was ever detected, or even strongly suspected, it has been kept a deep secret. It would be interesting to know what toxin, if any, was responsible. However, unless similar conditions recur the opportunity to find out may never again be presented.

A Case History (Dec. 5, 1936).—On Thursday morning, 40 cattle of all ages were turned into a replanted field, still quite green when frost came, containing red-purple stalks. One animal acted stupid that evening. One was dead and one dying on Friday evening. Half the night was spent with the herd. By Saturday evening, 17 were dead including 1 cow. Eleven were given dextrose treatment but only 3, or 27.3 per cent, showed even temporary improvement.—W. A. AITKEN.

Ethics Among Veterinarians

Ethics might be likened to the old saw about the weather, "Everybody talks about it but nobody does anything about it." However, this is not true in our profession because the AVMA Committee on Ethics has been active in recent years, first, in carrying on an educational campaign, and second, in stimulating interest in professional ethics at state and local levels. Members of that committee and others have suggested that a column in each issue of *The Journal* be devoted to a discussion on ethics. This we would be glad to do provided we could be assured of receiving sufficient contributions of a constructive nature to keep the column going.

Recently, we received an unsolicited article entitled "The Golden Rule in Veterinary Practice" (see p. 345), which is such an eloquent report of the successful cooperation between all the practicing veterinarians of the community, as well as with the allied professions, that it is a pleasure to publish it. We recommend it for reading and as a subject for discussion at all veterinary group meetings.

In some cities, physicians have also used the community system for giving similar around-the-clock emergency service. The Chicago Veterinary Medical Association is considering a similar plan.

We invite your comments on this or other phases of professional ethics or practices.

However, we do not wish this to become a gripe column. Have you any constructive comments or suggestions?

Swine Association Criticizes Control of Vesicular Exanthema

The National Association of Swine Records at a recent meeting charged that the spread of vesicular exanthema indicated lack of an efficient plan to meet emergency disease control. They reminded officials that the present embargo is restricting movements of breeding stock, that no one case has occurred in a purebred herd east of the Rockies, and that some regulations were creating unfavorable publicity for pork and pork products.

They called for uniform state regulations to conform with national regulations. They also urged immediate liquidation and quarantine of all affected herds east of the Rockies, rigid inspection of all public livestock markets, a quarantine of all animals going back to farms from public markets, and a state and federal ban on the feeding of uncooked garbage. They also urged that more funds be made available by federal and state governments for research on the treatment and prevention of all infectious diseases of swine. — *Hog Breeder*, Sept., 1952.

Anthrax Outbreaks

Forty-six outbreaks of anthrax were reported in 31 counties of 13 states during August, 1952. More than 160 animals died, including 90 swine, 70 cattle, and several sheep. Iowa lost 10 cattle and 25 swine in ten outbreaks in ten counties. Wyoming lost 61 swine in one outbreak and Florida lost 35 cattle in four outbreaks. Contaminated feed was the suspected cause in three outbreaks, vaccination in 16 outbreaks (Kansas), infected soil in four, and buzzards in four outbreaks. In 19 outbreaks the source of infection was unknown.—*U.S.D.A.*

The *Dairy Goat Journal* (Sept., 1952) tells how a pet dairy goat took over and became his seeing eye when an old man was stricken blind. She would go with him for long walks in the country and always brought him back home safely.

CURRENT LITERATURE

ABSTRACTS

Effect of Low Temperature on Liver Fluke Eggs in Beef Livers

Tests were made with the eggs of the common liver fluke, *Fasciola hepatica*, to determine the freezing temperatures that would destroy them under packinghouse conditions. Based on the results obtained, it was determined that, to destroy life of the fluke eggs, infected livers must be kept for not less than ten days at a temperature not higher than 15 F, or for a period of not less than five days at a temperature not higher than 10 F. The storage time at these temperatures must be doubled when the livers are packed in containers over 7 in., but less than 27 in., thick.—[Lisby L. Wade: *Effects of Low Temperature on the Eggs of the Common Liver Fluke (Fasciola Hepatica) in Beef Livers*. *Am. J. Vet. Res.*, 13, (July, 1952): 345-347.]

Study of Telangiectasis

Data are presented in the study of "telang" and its development through histochemical methods. The lesion results from accumulating metabolites involving distortion and erosion of the hepatic cells. The primary lesion is in the space of Disse. This disturbance is followed by coalescence of sinusoids forming cavernous blood spaces. The lack of leukocytic concentration and blood spaces with anoxia suggest a highly vulnerable lesion for bacterial invasion in some cases, or healing by hepatic cell proliferation in others.—[A. C. Andersen and G. H. Hart: *Histochemical Methods in the Study of Telangiectasis*. *Am. J. Vet. Res.*, 13, (July, 1952): 359-365.]

Canine Brucellosis

A study was made of histological changes in the tissues of dogs fed materials of cows infected with *Brucella abortus*. Corresponding controls were also studied. Most of the characteristic changes of the lymph nodes of dogs fed infected materials occurred in the lymph nodes of control dogs which were not exposed to *Br. abortus*. The two exceptions were the presence of granulomata (an involvement of 20%) and fibrocytic proliferation (17.7%). Approximately 15 per cent of the lymph nodes of the adult dogs fed infected materials contained multinucleated cells, as compared with about 2 per cent of the controls. Cells of this nature were not observed in the tissues of control puppies, but binucleated or multinucleated cells appeared in about 6.0 per cent of the lymph nodes of the group fed infected milk. Lymph nodes of both groups of dogs fed *Brucella*-infected

materials, as well as the control animals, contained areas of reticular scarring, necrosis, abscess formation, hemosiderosis, plasma cells, polymorphonuclear leukocytes, and eosinophils.—[Louise Wipf, E. V. Morse, S. H. McNutt, and H. R. Glatfeli: *Pathological Aspects of Canine Brucellosis Following Oral Exposure*. *Am. J. Vet. Res.*, 13, (July, 1952): 366-372.]

Chemotherapy of Enterohepatitis of Turkeys. I

The value of 2-amino-5-nitrothiazol in prevention and treatment of enterohepatitis of turkeys was determined. For this study, 950 turkeys separated into groups of 50 birds each were used. Exposure to *Histomonas meleagridis* was obtained by the use of litter from a chicken house. The drug, when given continuously in the ration at concentrations of 0.05, 0.04 and 0.03 per cent was effective in preventing mortality from the disease. It had little or no value in treating the disease after an outbreak had occurred.—[L. C. Grumbles, W. A. Bouey, and R. D. Turk: *Chemotherapy of Enterohepatitis of Turkeys. I. The Value of 2-Amino-5-Nitrothiazol in Prevention and Treatment*. *Am. J. Vet. Res.*, 13, (July, 1952): 383-385.]

Some Aspects of Congenital Passive Immunity to Newcastle Disease in Chicks. I

By means of the hemagglutination-inhibition (HI) test, the transfer of antibodies against Newcastle disease was traced from the laying hen to the chick via the egg yolk and through the developing embryo. Preliminary tests showed that the HI titers of egg yolks were a reliable quantitative index of the serum titers of the hens laying them. This maternal yolk titer remains constant during incubation, and the serum titer of the embryo does not ascend at its expense. Significant embryonic HI titers make their appearance in the blood serum only during the last few days of incubation, and do not appear at all in the allanto-amniotic fluid nor in the liver of the embryo. At hatching time, serum titers of chicks have reached only $\frac{1}{8}$ to $\frac{1}{4}$ of their highest value, which generally is reached at 2 to 3 days of age. This peak value does not necessarily equal the maternal titer, and may be significantly lower. The data indicate that chicks of a given dam have a quantitatively specific titer for each stage of their development.—[Simon Bornstein, A. Rantenstein-Arazi, and Y. Samberg: *Some Aspects of Congenital Passive Immunity to Newcastle Disease in Chicks*. *Am. J. Vet. Res.*, 13, (July, 1952): 373-378.]

FOREIGN ABSTRACTS

Effect of Antibiotics on Bull Semen

From June 1 to Sept. 30, 1951, the ejaculates from 58 bulls were divided into two portions, one of which was treated by adding 5,000 μ g. of dihydrostreptomycin sulfate per milliliter of diluent. It was found that the rate of conception was 60.1 per cent for the control material and 64.0 per cent for the semen to which the antibiotic had been added. In individual bulls where the rate of conception was low, the use of dihydrostreptomycin raised the percentage as much as 6.4 to 21.0 per cent. However, a few individuals with high conception rates had slightly lower rates when the antibiotic was added to the semen.

In a few bulls with *Vibrio fetus* infection, the rate of conception was raised due possibly to the inhibitory effect of the antibiotic on the microorganism.—[H. C. Adler and N. O. Rasbeck: *Studies on the Effect of Antibiotics on the Fertility of Bull Semen*. 2. 5,000 Micrograms of Dihydrostreptomycin Sulfate per Milliliter of Diluent with Special Reference to Its Application in Bulls Transmitting *Vibrio Fetus* Infection. *Nord. Vet.-med.*, 4, (June, 1952): 605-613.]—A.G.K.

Avian Tuberculosis in a Cow

A cow suspected of having tuberculosis was found to have tubercle bacilli in the milk. Tuberculin tests with bovine and avian tuberculin revealed greater reaction to the latter. Necropsy revealed tuberculous changes in the mammary gland, uterus, lungs, bronchial lymph nodes, and mammary lymph nodes. The microorganism was identified as avian because it produced progressive disease in rabbits and chickens but not in guinea pigs.—[Aage Thordal-Christensen: *A Case of Generalized Avian Tuberculosis in a Cow Shedding Avian Tubercle Bacilli in the Milk*. *Nord. Vet.-med.*, 4, (June, 1952): 577-587.]—A.G.K.

Lymphangitis in Horses

Following a review of the literature, the author presents the methods of analyzing the data gathered for the interval between 1939 and 1949 on approximately 5,000 cases of lymphangitis in horses. The disease appeared to be most common during the spring and autumn, although there was fluctuation from year to year. Since 1942, there appears to have been a gradual increase in the number of cases. With respect to age, the greatest incidence varied from year to year in various groups. For example, in 1946 and 1947, the highest incidence occurred in the age group of 10 to 12 years, whereas in 1948 it was in the group 7 to 8 years of age. There appeared to be no breed disposition.

In a typical case, there is a rise in temperature and increased pulse rate which recede within four to five days. Edema of the limbs is maximal on about the fifth day. There is a slight neutrophilia,

but the changes in the leukocyte count are not great. In 11 cases studied, the sedimentation rate was a mean of 132.4 minutes \pm 6.1 in contrast to 57.7 \pm 7.2 for normal horses. There is a reduction in albumin and a rise in globulin, fibrinogen, and total protein, reaching a maximum in eight to nine days. Bilirubin increases moderately.—[Gunnar Tufvesson: *Lymphangitis in Horses*. II. A Statistical and Clinical Study. *Nord. Vet.-med.*, 4, (June, 1952): 529-576.]—A.G.K.

A Transfixation Plaster Cast for Small Animal Fractures

The method consists of putting transverse stainless steel pins through the bones on either side of the fracture and fixing the pins by means of a plaster cast. The leg is first placed in position by means of a Thomas splint. One or more pins are forced through the skin, muscle, and bone, and are left long enough so that the plaster cast can be fixed to them as it is being applied. The pins should not be parallel. The soft tissues are protected by bandages and cotton applied before the plaster.

The bandage may be removed in four to six weeks depending on the age and condition of the dog. The method is useful for open reduction. The paper is illustrated by eight photographs including roentgenographs.—[Gustaf Björck: *A Transfixation Plaster Cast in the Treatment of Fractures in Small Animals*. *Nord. Vet.-med.*, 4, (Feb., 1952): 89-115.]—A.G.K.

Intra-Abdominal Anesthesia in Pigs

Intra-abdominal chloral hydrate anesthesia was used for about three years on young pigs for surgery for scrotal hernia, umbilical hernia, and cryptorchism. There was a mortality of 10 per cent due to peritonitis from the chloral hydrate. It was found that intra-abdominal injection of 5 per cent chloral hydrate in guinea pigs produced peritonitis, whereas 5 per cent pentothal sodium was well tolerated. It is recommended that pentothal sodium be used intra-abdominally for young pigs instead of chloral hydrate.—[Lars Hassler: *Some Observations on Intra-Abdominal Anesthesia in Young Pigs*. *Nord. Vet.-med.*, 4, (June, 1952): 595-603.]—A.G.K.

A New Outbreak of Newcastle Disease

In November of 1951, Newcastle disease occurred near Stockholm in an isolated flock. It was probably introduced by feeding kitchen refuse containing offal from imported frozen partridges. The virus was identified by inoculation of embryonating eggs and by hemagglutination-inhibition tests. The outbreak was controlled by slaughter of all exposed fowl. A plea is made to study the cause of all acute diseases of chickens with respect to differentiation between fowl plague and New-

castle disease.—[N. O. Lindgren, Z. Dinter, and I. Lawritsson: *A New Outbreak of Newcastle Diseases in Sweden. Nord. Vet.-med.*, 4, (June, 1952): 588-594.]—A.G.K.

Hard Pad Disease

This disease was reported in Indonesia for the first time. The affected dog died, and the literature indicates that the mortality is about 90 per cent. Evidence of encephalitis was indicated. The disease was often accompanied by cramps, fits of howling and barking, salivation, and epileptiform attacks. Sometimes a marked nystagmus and a convulsive tic in certain skeletal muscles were noted. A severe enteritis and gastritis, fever, and dullness completes the clinical picture. The name "hard pad" indicates that the disease is always accompanied by a marked hyperkeratosis of the foot pads which take on the form of a hard disc.—[A. M. Ernst and Sikar: *Hard Pad Disease. Hemera Zoa*, (Jan.-Feb. 1952): 103-104.]—L.V.E.

Neurolymphomatosis and Leukosis

After a general survey pertaining to the etiology and epidemiology of neurolymphomatosis and leukosis, the authors arrived at the conclusion that these problems are not yet solved. In order to check on the opinions pertaining to the lower frequency of neurolymphomatosis and the higher one of leukosis since World War II, a study was made of the available statistics. In this study no useful factors were disclosed. A study of the influence of the seasons yielded no results about neurolymphomatosis, but it did show that the highest frequency of leukosis seemed to appear at the end of winter and the lowest during summer.—[L. M. G. Geurden and N. Viaena: *Consideration of the Problem of Neuro-Lymphomatosis and Leucosis. Vlaams Diergeneesk. Tijdschr.*, 22, (1952): 73-79.]—L.V.E.

Zinc Phosphide Poisoning of Game Animals

The examination of dead fowl revealed that during a dry period poisonous wheat kernels had been scattered about for the destruction of field mice. Wild geese suffered the most (500 to 1,000 of a total of 7,000 died) but a considerable number of ducks, partridges, and hares were also poisoned.—[W. M. Gotink and F. W. van Hulsen: *A Massive Mortality of Game Animals by Poisoning with Zinc Phosphide. Tijdschr. voor Diergeneesk.*, 77, (1952): 224-229.]—L.V.E.

BOOKS AND REPORTS

Public Health and Welfare in Japan

This, the fourth and final report, summarizes the progress made during 1951 and 1952 by the Medi-

cal Section, General Headquarters, Supreme Command for the Allied Powers in Japan.

The chapter "Veterinary Affairs" reports that one new veterinary school recently opened in Japan but one closed, leaving 14. They graduated 616 students in 1952.

The report on infectious disease cases in Japan for 1951 shows: anthrax, 13; swine cholera, 2,356; swine erysipelas, 511; infectious anemia in horses, 8,366; infectious abortion in horses, 480; enzootic encephalitis of horses, 267; influenza of cattle, 46,914; brucellosis, 167; rabies, 17; blackleg, 2; Newcastle disease, 22,547.

Since the Veterinary Affairs Division of the Allied Powers was closed in June, 1951, its activities are being continued by the Ministry of Agriculture and Forestry.—[*Public Health and Welfare in Japan. Final Summary—1951 and 1952. Issued by General Headquarters, Supreme Commander for the Allied Powers, Medical Section, Public Health and Welfare Division. Vol. 1. 136 pages. Illustrated.*]

Instructor's Guide, Sanitary Food Service

Although a U. S. Public Health Service publication, considerable collaboration was received from the Armed Forces (particularly the Navy), the Office of Education, other federal agencies, and state and municipal health departments.

It is not only an informative book from the standpoint of the latest knowledge in food sanitation, but it was written primarily to explain how this knowledge can be transposed into the minds and hands of those who prepare and serve food. This publication is recommended for use by state and local health departments for training food-service personnel; by state and local education specialists for conducting classes for food-service personnel; and by operators of private eating and drinking establishments for in-service training.—[*Instructor's Guide, Sanitary Food Service. By Federal Security Agency, Public Health Service, Division of Sanitation, Milk and Food Branch, Washington 25, D. C. (1952). Illustrated. 209 pages. Price, \$1.50.*]

REVIEWS OF VETERINARY MEDICAL FILMS

Protecting Poultry Profits.—Sound 16-mm., color, running time about twenty minutes. Produced by Merck & Company, Rahway, N. J., and available from Jam Handy Organization, 2821 E. Grand, Detroit 11, Mich. An enjoyable, educational film well documented with information about modern methods in the proper management of poultry flocks, it graphically illustrates the life cycle of coccidia. Most of the last half of the film is devoted to a discussion of sulfaquinolaxine and its place in poultry disease control.

THE NEWS

AVMA Initiates Program for Assisting Officers Separated from Service

Under the auspices of the Emergency Advisory Committee, the AVMA will assist veterinarians separated from the Armed Services, in resettlement in civilian life. All officers recently, or soon to be, separated, are offered an opportunity to file a record with the committee of their special education, experience, and preferred geographical location.

The committee is soliciting the assistance of the secretaries and the Emergency Advisory Committee chairmen of the constituent associations in this work. Names of officers desiring a position in research and teaching, for example, will be furnished to institutions and agencies who employ veterinarians for such purposes.

The program has only recently been inaugurated. Some veterinarians, separated several weeks or months ago, may still want to take advantage of this service. The committee will be pleased to hear from them.

Addition to 1952-1953 Roster

The Special Committee on Canine Encephalitis was not listed in the Official Roster (see Oct., JOURNAL, pp. 326-336), inasmuch as the chairman's acceptance of his appointment by President W. L. Boyd had not been received when the JOURNAL went to press. Following are the members of the Committee:

E. P. Leonard, *Chairman*, New York State Veterinary College, Cornell University, Ithaca, N.Y.

W. F. Irwin, 3550 S. Peoria St., Tulsa, Okla.
Frank Bloom, 137-38 Northern Blvd., Flushing, L.I., N.Y.

U. S. GOVERNMENT

Dr. Manthei to Serve on WHO.—Dr. Chester A. Manthei (MSC '35), of the Bureau of Animal Industry, has been appointed to serve for five years as a member of the World Health Organization's expert advisory panel on brucellosis. He left Sept. 27, 1952, for Florence, Italy, to attend the conference. While in Europe, he plans to visit research laboratories in Switzerland and England.

S/GRANT E. BLAKE, *Secretary*,
District of Columbia V.M.A.

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. Bureau of Animal Industry are reported as of Sept. 19, 1952.

NEW APPOINTMENTS

Harold E. Beckman, Olympia, Wash.
Raymond E. Caldwell, Harrisburg, Pa.
George W. Fischer, Nashville, Tenn.
Newton A. McCosh, Denver, Colo.
William A. Kittrell, Richmond, Va.
Wendell G. Peart, Sacramento, Calif.
Wendell L. Pinckard, Nashville, Tenn.
Stanton G. Possion, Louisville, Ky.
John Redmond, Dade City, Fla.
John S. Sickles, Boston, Mass.
Thomas E. Traylor, Denver, Colo.
Benjamin Weiner, Boston, Mass.

MILITARY FURLOUGH AS VETERINARY TRAINEE

Charles W. Freudenberg, Indianapolis, Ind.
William E. Keeler, Madison, Wis.

CANCELLATION

Tony C. Wille, Jr., Frankfort, Ky.

RESIGNATIONS

George C. Faun, Cleveland, Ohio.
James Guess, Mexico City, Mex.
John E. Johnson, Nashville, Tenn.
Bronislaw Mordowski, Madison, Wis.
Merlin A. Nelson, Mexico City, Mex.
Edward F. Otto, Newark, N. J.
Robert E. Riordan, Des Moines, Iowa.
James E. Varsady, Los Angeles, Calif.
James H. Womack, Olympia, Wash.

RETIREMENTS

Ralph H. Crowell, Chicago, Ill.
Owen L. Lockwood, Baltimore, Md.
Alford T. Ostendorf, Chippewa Falls, Wis.

TERMINATION

Clinton E. Burkholder, Indianapolis, Ind.

TRANSFERS

James W. Allen, from Mexico City, Mex., to Fort Worth, Texas.
Richard S. Archer, from Boston, Mass., to New Haven, Conn.
Edward R. Betlach, from Mexico City, Mex., to Bismarck, N. Dak.
Wiley W. Bird, from Mexico City, Mex., to National Stockyards, Ill.
Lawrence D. Boston, from Oklahoma City, Okla., to Denver, Colo.
Stanley E. Cohen, from Harrisburg, Pa., to Indianapolis, Ind.
William O. Fidler, from Indianapolis, Ind., to Chicago, Ill.
Loyal H. Fisk, from Los Angeles, Calif., to Nampa, Idaho.
William D. Foss, from Madison, Wis., to Dubuque, Iowa.
Harold A. Krig, from Harrisburg, Pa., to Madison, Wis.

WOMEN'S AUXILIARY

Are YOU a Member of the AVMA Auxiliary?—Active membership in the AVMA Auxiliary is open to the wives, daughters, mothers, sisters, and widows of veterinarians who are, or were while living, members in good standing of the AVMA. Associate membership is open to women interested in the Auxiliary but not eligible for active membership. Student mem-

bership is open to the wives of veterinary students who are members of a student chapter of the association.

Our objectives are: To assist the association in advancing the science and art of veterinary medicine, including their relationship to the public health; to assist selected veterinary students with loans and awards; to strengthen the bonds of friendship among women connected with the veterinary profession.

Thirty-five years ago, 50 women made up the charter membership list. We have enjoyed a steady growth since that time. Today, our membership totals 2,628. There are 16,427 veterinarians listed in the 1952 AVMA Directory, who are located in the United States and Canada. Our potential strength is very great. We are proud of our membership list but we would like to see it grow and grow.

Reasons for joining the Auxiliary vary. Some wish to participate actively in the Auxiliary program while others wish to lend moral support. All of us, I feel sure, are anxious to uphold the objectives set forth in our constitution. It is so easy to join our Auxiliary. Simply write to our secretary, Mrs. C. M. Rodgers, Blandinsville, Ill., and enclose your check for \$1. We need your continued support and we hope we can be of service to you.

Women's organizations are powerful groups. Let's all work together to assist in our program of awards, loans, research fund-raising, and our newest project, *The Auxiliary News*. Above all,

let's work together to create good will and understanding for the veterinary profession.

S/(MRS. R. A.) LAURA RUNNELLS,
President-Elect.

• • •

Michigan Auxiliary.—The Women's Auxiliary to the Michigan State Veterinary Medical Association held their twenty-first annual meeting, at which the charter members were honored, on Aug. 19-20, 1952, at Cromer's Restaurant in Flint. Mrs. H. S. Atkins, Flint, was general chairman. The charter members present were: Mrs. F. E. Caswell, North Adams; Mrs. E. B. Cavell, Northville; Mrs. Lee Davisson, Okemos; Mrs. H. P. Hoskins, Evanston, Ill.; Mrs. E. K. Sales, East Lansing; Mrs. A. S. Schlingman, Grosse Pointe; and Mrs. L. A. Wileden, Mason.

The luncheons, decorations, and entertainment were enjoyed throughout the two-day meeting. A book review, readings, a garden tour, table favors, and door prizes contributed to the successful program.

The annual business meeting of the Auxiliary was called to order by the president, Mrs. F. D. Egan, Farmington, on August 19. Mrs. R. A. Runnells, East Lansing, projects chairman, reported that four books had been purchased for the library of the veterinary school at Michigan State College.

The following officers were elected: Mrs. H. S. Atkins, Flint, president; Mrs. B. C. Hekhuis, Coopersville, vice-president; Mrs. John P. Newman, East Lansing, secretary-treasurer.



Members of the Michigan Women's Auxiliary who took the garden tour arranged for them during their twenty-first annual meeting in Flint, Aug. 19-20, 1952. Those in the front row (left to right) are—Mrs. E. K. Sales, charter member of the Michigan Auxiliary; Mrs. F. D. Egan, president (1951-1952); Mrs. H. S. Atkins, general chairman of the annual meeting; Mrs. S. P. Curell, vice-president; and Mrs. H. E. Johnson, charter member. The charter members were honored at this meeting. Mrs. H. Preston Hoskins, Evanston, Ill., is shown standing back of Mrs. Atkins.

The group was happy to have Mrs. R. A. Runnells, president-elect of the Women's Auxiliary to the AVMA, extend greetings in their behalf. Mrs. Runnells gave a brief report of the Thirty-Fifth Annual Meeting of the Women's Auxiliary to the AVMA in Atlantic City, told of the Auxiliary's four projects, and extended a cordial invitation to attend the next meeting in Toronto.

s/(Mrs. JOHN P.) EDITH NEWMAN, Secretary.

• • •
Eastern Iowa Auxiliary.—On Oct. 9-10, 1952, the Women's Auxiliary to the Eastern Iowa Veterinary Medical Association met in the Hotel Montrose in Cedar Rapids. Events on the social calendar included a luncheon, millinery style show, card party, shopping, and the banquet.

s/MRS. W. M. LYNCH, Chairman,
Entertainment Committee.

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Kentucky Auxiliary.—On July 23-24, 1952, the following officers were elected to serve the Women's Auxiliary to the Kentucky Veterinary Medical Association: Mrs. Robert Bardwell, Lexington, president; Mrs. H. H. Sutton, Lexington, vice-president; and Mrs. H. S. White, Lexington, secretary-treasurer.

• • •
New York Auxiliary.—The New York State Veterinary Medical Society and the Women's Auxiliary met at Bolton Landing in the Sagamore Hotel on Lake George, Sept. 10, 12, 1952, with the Hudson Valley Society our hosts. This was the sixty-first meeting for the New York State V.M.S. but only the fourth for the Auxiliary as an organized group, although the women have always been invited and attended the meetings. They are always friendly, happy affairs and this was no exception.

The business meetings and the scientific papers and discussions for the men were held in the mornings, and the afternoons and evenings kept open for the joint social program with the women. These included a party in the evening of September 9, preceding the formal opening, and it must have been gratifying to the committees to welcome such a large number to this "come early and meet your friends" mixer. Other entertainment offered during the meeting: a trip to Fort Ticonderoga; a twilight cruise aboard the luxurious M/V Ticonderoga on beautiful Lake George, through the courtesy of the Hudson Valley Medical Society; a first-run movie for those who did not wish to go on the boat ride; a wiener roast on the dock late in the evening; men's and women's golf tournaments and skeet shooting with trophies awarded; putting on the lawn; wonderful meals, with a special buffet luncheon one day, and the annual banquet, preceded by the president's reception and cocktail party on the spacious verandas of the hotel; entertainment and dancing every night; a mid-day demonstration by the Bell

Telephone Co., when calls were made to Washington, D.C., Chicago, and California, and the conversations carried over a loud speaker so that all could hear the messages from General McCallam, Dr. Van Houweling, and Mr. Chas. S. Travers.

As the Sagamore is an American plan hotel, we were together at meals, which induced friendliness and offered opportunities for visiting.

The Auxiliary held a council meeting the first morning when reports were given by representatives of the local groups. We found that seven of the ten are organized now, but all ten groups reported get-togethers and dues collected for the state Auxiliary. The board met on the second morning, and on the third day the annual meeting was held. Greetings were read from our national president, Mrs. MacDonald. New by-laws were adopted, some changes in the constitution proposed, and four projects were unanimously adopted for this coming year: (1) to increase the gift to a needy, deserving student at Cornell to \$50; (2) to give \$50 to the New York State Veterinary College Research Fund, and \$25 to the AVMA Research Fund; (3) to pay the expenses up to \$50 of a representative from the student auxiliary to attend our meeting and report back to her group; and (4) to entertain the girls of the student auxiliary with an evening party at conference time next January. This represents a big program for the Auxiliary but the interest and enthusiasm are great, and we hope to make our help and influence felt in the profession. As our membership grows, we can do more and more. The Auxiliary is also aiming at the largest membership in the AVMA Auxiliary!

This year, for the first time, we had representatives from both the New York Student Chapter of the AVMA and its auxiliary, the whole expense being carried by the New York state society, with the hope and expectation that the Auxiliary in the future would assume the expenses for the student auxiliary representative. This was unanimously adopted, as reported above. Mrs. Robbins (the representative this year) was one of our honor guests, and she contributed much with her charming friendly personality and her fine report on the student auxiliary activities.

At the formal opening session of the Society, the president, Dr. McAuliff, graciously asked the president of the Auxiliary, Mrs. W. A. Hagan, to appear on the program with him, and this gesture and acknowledgment of our organization was appreciated by the women. We have grown from a mere 60 in 1949 to our present membership of 195 (as of Oct., 1952).

The following officers were elected for the coming year: Mrs. J. R. Hoyt, New Berlin, president; Mrs. A. L. Brown, Adams, president-elect; Mrs. C. E. DeCamp, Scarsdale, secretary; Mrs. Frederick Schutz, Brewster, treasurer;

Mrs. W. E. Weitz, Snyder, membership chairman; and Mrs. W. A. Hagan, Ithaca, representative to the Women's Auxiliary to the AVMA House of Representatives.

It was at this meeting that it was voted to keep the immediate past president on the board for one year to represent us at the national meeting.

Lake George compares favorably with the beautiful lakes of Switzerland and certainly the beauty is unsurpassed in this country. All of us left the meeting feeling that we had had not only the pleasure of renewing friendships and profiting from the programs offered, but also a great lift and feeling of luxurious relaxation in the enjoyment of such beautiful surroundings for a few days.

S/(Mrs. W. A.) ESTHER HAGAN, *President*.

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative By-Laws.

- BRADLEY, CHARLES J.
Box 583, Americus, Ga.
D.V.M., Alabama Polytechnic Institute, 1952.
- BYRAM, ROBERT L.
483 Northland Dr., Rockford, Mich.
D.V.M., Michigan State College, 1946.
- COX, WALTER R.
2508 Dupont St., Flint, Mich.
B.V.Sc., Ontario Veterinary College, 1913.
- DOMINGUEZ, CELESTINO T.
9367 Coyle Ave., Detroit 28, Mich.
D.V.M., Michigan State College, 1946.
- GOLDBERG, S. MORRIS
8006 MacArthur Blvd., Oakland 5, Calif.
V.M.D., University of Pennsylvania, 1946.
- GROSS, DEAN R.
Gross Animal Clinic, 210 W. Beecher (Rear),
Jacksonville, Ill.
D.V.M., Kansas State College, 1944.
- JONES, DAVID O.
College of Veterinary Medicine, Ohio State
University, Columbus, Ohio.
D.V.M., Ohio State University, 1943.
- KEYSER, PETER
2560 Lapeer Ave., Port Huron, Mich.
V.S., Grand Rapids Veterinary College, 1911.
- MARTELL, JOHN R.
Rt. 1, Box 137, Spring Lake, Mich.
B.V.Sc., Ontario Veterinary College, 1928.

- RITCHIE, HOWARD T.
Buffalo, N. Dak.
D.V.M., Indiana Veterinary College, 1916.
- SAUNDERS, JAMES WILLIAM
John Street, Embro, Ont.
D.V.M., Ontario Veterinary College, 1950.
- SMITH, JESSE W.
1841 Oak Bay Ave., Victoria, Canada.
V.S., Ontario Veterinary College, 1919.
- STRIEBER, WILLIAM R.
4105 Pershing Drive, El Paso, Texas.
D.V.M., Texas A. & M. College, 1946.
- THROWER, SAMFORD E.
700 N. Greenwood St., LaGrange, Ga.
D.V.M., Alabama Polytechnic Institute, 1947.
- WELLS, KENNETH F.
506 Piccadilly Ave., Ottawa, Canada.
D.V.M., Ontario Veterinary College, 1938.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised in the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

- SANTECO, RODOLFO T., JR.
1683 Kalakaua Ave., Honolulu, Hawaii.
D.V.M., University of the Philippines, 1951.
Vouchers: A. K. Gomez and W. F. Parker.
- VAN ZANDT, JOHN N.
97th Vet. Food Insp. Det., Fort Clayton, Canal
Zone.
D.V.M., Texas A. & M. College, 1948.
Vouchers: E. T. Marsh and Robert L. Rennick.

Second Listing

- ECHENAGUSIA, HUGO, 441 N. Lake St., Madison,
Wis.
- PARHAM, WILLIAM M., JR., Rt. 2, Box 292 F,
Portsmouth, Va.

1952 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

University of Illinois*

- LOOMIS, CLIFFORD E., D.V.M.
R.R. 4, Ottawa, Ill.
Vouchers: L. E. St. Clair and Roger Link.

Ohio State University*

DENHAM, JAMES A., D.V.M.
Owensboro, Ky.
Vouchers: C. D. Diesem and R. E. Rebrassier.

University of Pennsylvania

FRENCH, CHARLES R., V.M.D.
832 High St., Williamsport, Pa.
Vouchers: R. C. Snyder and R. G. Little.

Second Listing

University of California*

HILL, HARRY H., D.V.M., P. O. Box 791, 44
McNeill St., Encinitas, Calif.

Colorado A. & M. College

ZIRIAX, ROBERT L., JR., D.V.M., Box 517, Williams,
Ariz.

Iowa State College

BRICKER, JOHN J., D.V.M., Greenfield, Iowa.
CHACE, WALTER R., JR., D.V.M., Pilger, Neb.
GOOCH, MARSHALL H., D.V.M., 2704 Lincolnwood
Dr., Evanston, Ill.
ROBINSON, EVERETT L., JR., D.V.M., R.F.D. 2,
Lee's Summit, Mo.
SCHOLTEN, ROBERT, D.V.M., Box 336, Sanborn,
Iowa.
STROHBEHN, ARTHUR M., D.V.M., 590 N. 20th,
Salem, Ore.

University of Illinois*

FINE, RICHARD B., D.V.M., 504 Requiza Rd.,
Encinitas, Calif.

Michigan State College

FARRIS, HARRY B., D.V.M., 1000 S. Euclid, Bay
City, Mich.
JONES, ROBERT OWEN, D.V.M., 3927 Fort St.,
Lincoln Park, Mich.
SCHWABE, OTTO, D.V.M., 90-34 Francis Lewis
Blvd., Queens Village, N.Y.

University of Pennsylvania

AWKERMAN, LOY C., V.M.D., 150 S. Main St.,
Manheim, Pa.
BOWEN, NELSON D., V.M.D., 1 High St., Mont-
rose, Pa.
DOLINGER, SOL, V.M.D., 49-12 Queens Blvd.,
Woodside, N. Y.
FRIEDRICH, DAVID G., V.M.D., 6117 W. Main St.,
Fogelsville, Pa.
GUENTHER, FREDERICK R., V.M.D., 614 Bloom St.,
Danville, Pa.
NILSSON, LAURS S., JR., V.M.D., Milk St., Box
13, Branchville, N. J.
WIDMANN, RAYMOND J., V.M.D., 3934 Spruce
St., Philadelphia 4, Pa.

Texas A. & M. College

ELSTON, DAVID M., D.V.M., Box 206, Gonzales,
La.
MARTIN, D. B., JR., D.V.M., Box 2443, Longview,
Texas.
TILLERY, JOE B., JR., D.V.M., 5619 Yale St.,
Dallas, Texas.

Washington State College

BECKMANN, HAROLD E., D.V.M., 2501 N. Nor-
mandie St., Spokane, Wash.
IRWIN, ADDISON L., D.V.M., 310 Taft Hwy.,
Bakersfield, Calif.
KELLER, FRED W., D.V.M., Box 704, Redmond,
Wash.
MARUGG, GEORGE M., D.V.M., 2602 6th St., Apt. 2,
Tillamook, Ore.
PAZARUSKI, JAMES P., D.V.M., 210-7th Ave.,
Anchorage, Alaska.
REDISKE, RAYMOND R., D.V.M., 321 Wellington
Ave., Walla Walla, Wash.
RHODEFER, ERNEST T., D.V.M., 9825 N. E. 1st,
Bellevue, Wash.
SCHMUTZ, MILTON D., D.V.M., 910 N. Pierce,
Opportunity, Wash.
STORMS, LESTER "C", D.V.M., 4310 S.W. Prim-
rose, Portland 19, Ore.
THOMPSON, LEONARD A., D.V.M., c/o Kerrisdale
Veterinary Hospital, Vancouver, B. C.
VANDEVOORT, GLEN R., D.V.M., Box 212, Oak-
ville, Wash.
VIRGIN, JOSEPH O., D.V.M., 5025-25th, N.E., Seat-
tle 5, Wash.
WRIGHT, HOWARD L., D.V.M., 3716 N. 13th, Ta-
coma, Wash.

AMONG THE STATES AND PROVINCES

Arkansas

Practitioners Association.—The second an-
nual Arkansas Veterinary Practitioners Associ-
ation Convention was held at the Hotel Marion
in Little Rock, July 20-22, 1952, with approxi-
mately 60 graduate veterinarians attending.

Speakers for this three day event were: **Drs. R. D. Turk**, Texas A. & M. College, College Station; **George T. Edds**, Ft. Dodge Labora-
tories, Ft. Dodge, Iowa; **George T. Dugan**,
Texarkana; **Louis Leonpacher**, Lafayette, La.;
A. H. Quin, Jensen-Salsbery Laboratories,
Kansas City, Mo.; **Harry Hilhouse**, Lafayette,
La.

The election of officers resulted as follows:
Drs. George T. Dugan, Texarkana, president;
Carey Clark, El Dorado, vice-president; **W. L. Thomas**, Little Rock, secretary-treasurer.

California

Personal.—**Dr. L. M. Hurt** of Los Angeles,
former president of the AVMA, has been

elected director of the Farmers Insurance Exchange and the Fire Insurance Exchange of California.—*West. Livestock Weekly, June 5, 1952.*

Delaware

Dr. Cover Joins Staff of Agricultural Station.—Dr. Morris S. Cover (UP '33) joined the staff of the University of Delaware Agricultural Experiment Station on Aug. 1, 1952, as an associate professor. In addition to his V.M.D. degree, Dr. Cover received his M.S. degree from Kansas State College in 1943 and his Ph.D. degree from the University of Illinois in 1952. He will be in charge of all poultry disease research work. Associated with Dr. Cover in this program are Drs. Eugene Gill and Jaroslav Geleta, both of whom received their D.V.M. degrees from the University of Munich, Germany, in 1951.

S/E. F. WALLER, *Resident Secretary.*

District of Columbia

Association of Military Surgeons to Convene in Washington.—The fifty-ninth annual convention of the Association of Military Surgeons of the United States will be held at the Hotel Statler in Washington, D. C., on Nov. 17-19, 1952. Two veterinarians will appear on the program during the general sessions of the Association. Colonel W. O. Kester, U. S. A. F. (V.C.), will discuss "Modern Military Veterinary Medicine," and Dr. Frank Todd (F.C.A.D.) will present a paper on "Veterinary Medicine in Civil Defense."

Brigadier General J. A. McCallam, president of the Veterinary Section, extends an invitation to all veterinarians to attend.

Florida

Personal.—Dr. A. R. Chambers (API '49) recently purchased the hospital and practice of Dr. D. W. Jensen (COL '44) in Jacksonville, Fla.

Illinois

Veterinarians Participate in Milk Industry Foundation Program.—Among those who appeared on the program of the forty-fifth annual convention of the Milk Industry Foundation (formerly the International Association of Milk Dealers) held in Chicago on Sept. 24-26, 1952, were Dr. James M. Murphy, New York State Veterinary College, whose topic was "Mastitis from the Standpoint of Control," and Dr. S. F. Scheidy, Sharp and Dohme, West Point, Pa., who gave an illustrated lecture on "Diseases of Dairy Cattle that may Affect the Safety, Wholesomeness and Palatability of Milk."

Northern Illinois Association.—The fall meeting of the Northern Illinois Veterinary Medical Association was held Sept. 17, 1952, in the Hotel Faust, Rockford. The following speak-

ers comprised the scientific program: **Drs. John A. Pinkos**, director of dog food research, Quaker Oats Co.; **E. A. Woelffer**, Oconomowoc, Wis.; **R. J. Johnston**, Pitman-Moore Co., Zionsville, Ind.; **Morris Erdheim**, Grayslake; **Edward A. Schill**, U.S. Bureau of Animal Husbandry; **R. C. Klussendorf**, director of veterinary medical services, Commercial Solvents Corp., Terre Haute, Ind.; **Frank Connor**, Morris, Ill.; **John T. Foley**, Cary; and **Herbert P. Wessels**, Geneva.

S/L. W. DERRER, *Secretary.*

Animal Care Panel.—The following speakers will present papers at the third annual meeting of the Animal Care Panel, to be held in Chicago on December 3-4: **Drs. C. A. Griffin**, Division of Laboratories and Research, New York State Department of Health, Albany; **Jules S. Case**, Kettering Laboratory, University of Cincinnati, Cincinnati, Ohio; **B. Eddie**, George Williams Hooper Foundation, University of California, San Francisco; **J. A. Baker**, Veterinary Virus Research Institute, New York State Veterinary College, Ithaca; **R. J. Flynn**, Argonne National Laboratory, Chicago; **N. R. Brewer**, University of Chicago; **F. S. Robscheit Robbins**, School of Medicine, University of Rochester, Rochester, N. Y.; **Theodore Zucker**, College of Physicians and Surgeons, Columbia University, New York, N. Y.; **Samuel Poiley**, National Institutes of Health, Bethesda, Md.; **Elihu Bond**, University of Illinois, Chicago; **Bennett J. Cohen**, Northwestern University Medical School, Chicago.

The "Proceedings" of the Animal Care Panel will be published as soon as possible after the meeting. It will be distributed at cost.

A Farm Journal Publicizes Veterinarian.—The September, 1952, issue of the *Illinois Farm Bureau Record*, in an article written to stimulate interest in the eradication of Brucellosis in cattle, has featured Dr. Tom Wise of Effingham, Ill. Three pictures of Dr. Wise at work and one of Mrs. Wise sending out a call on their short-wave radio make fine publicity of the veterinary profession. Dr. Wise is a 1940 graduate of Alabama Polytechnic Institute.

Leptospirosis in Illinois.—Leptospirosis in cattle, and probably in other farm animals, has been identified in eight counties in the northern half of Illinois. It has been identified as *Leptospira pomona* type of infection. This is the type which causes swineherds disease in man, but no human cases have as yet been reported in Illinois.—*Illinois Health Messenger, Sept. 1, 1952.*

Indiana

Indiana-Illinois Association.—Dr. Joe Green, state veterinarian of Indiana, discussed vesicular exanthema at the Sept. 12, 1952, meeting of the Indiana-Illinois Veterinary Medical Association.

This, and other diseases, were then discussed by the group.

Dr. and Mrs. D. W. Gerber of Clay City were host and hostess.

s/J. L. KIXMILLER, *Resident Secretary*.

Ninth District Association.—Dr. and Mrs. W. A. Brown of Seymour were hosts to the Ninth District (Ind.) Veterinary Medical Association on August 22. Dr. Joe Green, state veterinarian, discussed vesicular exanthema and the importance of thorough inspection and reporting of suspicious cases.

s/J. L. KIXMILLER, *Resident Secretary*.

Northwestern Association.—The Northwestern Indiana Veterinary Medical Association met at Brook on Aug. 28, 1952. Dr. A. L. Delez, of Purdue University, Lafayette, spoke on the diagnosis of diseases of livestock and told how the laboratory can aid the practitioner.

The women met at the home of Dr. and Mrs. N. K. Decker who were the hosts.

s/J. L. KIXMILLER, *Resident Secretary*.

Sixth District Association.—At the September 10 meeting of the Sixth District (Ind.) Veterinary Medical Association, in Mechanicsburg, Dr. Joe Green, state veterinarian, spoke on vesicular exanthema as it exists in Indiana and some of the neighboring states. The subject was then discussed from the floor and pictures were shown of cattle affected with the disease.

The women were entertained in the home of Mrs. Blubaugh. Dr. Blubaugh, president of the association, and Mrs. Blubaugh were hosts to the group.

s/J. L. KIXMILLER, *Resident Secretary*.

Tenth District Association.—On August 21, the Tenth District (Ind.) Veterinary Medical Association met in Rushville, with Dr. and Mrs. Lowell Hinchman and Dr. and Mrs. W. Buhler serving as hosts. After a round-table discussion of subjects of timely interest to veterinarians, members enjoyed dinner, cards, and dancing.

s/J. L. KIXMILLER, *Resident Secretary*.

Iowa

Cedar Valley Association Officers.—Newly elected officers of the Cedar Valley Veterinary Medical Association are: Drs. A. J. Murphy, Winthrop, president; H. V. Henderson, Rienbeck, vice-president; and F. E. Brutsmann, Traer, secretary-treasurer.

s/F. E. BRUTSMANN, *Secretary*.

Eastern Association.—The thirty-ninth annual meeting of the Eastern Iowa Veterinary Medical Association was held on Oct. 9-10, 1952, in the Hotel Montrose, Cedar Rapids.

Scientific papers were presented by Drs. G. H. Moore, Michigan State College, East Lansing; C. H. Kernkamp, University of Min-

nesota, St. Paul; J. D. Ray, Affiliated Laboratories, White Hall, Ill.; A. H. Quin, Jensen-Salsbery Laboratories, Kansas City, Mo.; F. E. Condon, Vita-Vet Laboratories, Marion, Ind.; A. R. Stephenson, Bennett; Paul C. Bennett, Iowa State College, Ames; A. F. Allison, Marshalltown; Guy S. Jones, district veterinarian, Iowa Department of Agriculture, Cedar Rapids; Frank Thorp, Michigan State College, East Lansing; W. L. Boyd, St. Paul, Minn., president of the AVMA; and Warren E. Bowstead, Lowden.

s/NATHANIEL R. WAGGONER, *Secretary*.

Officers of Coon Valley Association.—The new officers of the Coon Valley Veterinary Medical Association, which meets at Storm Lake, Iowa, the second Wednesday of each month, September through May, are: Drs. V. D. Ladwig, Sac City, president; R. L. Wiedemeier, Lytton, vice-president; and J. R. Rosdail, Newell, secretary-treasurer.

s/J. R. ROSDAIL, *Secretary*.

Dr. Evans Investigates Diseases of Parakeets.—Dr. George A. Evans (ISC '20) of Clarion, Iowa, is in the news as a breeder of budgerigars (a species of parakeet). He has about 200 of the varicolored birds. He was recently named as veterinarian for the American Budgerigar Society and much of his spare time, from a busy general practice, is taken in investigating and answering mail regarding the diseases of these birds.

Kansas

Kansas City Association.—At the September 16 meeting of the Kansas City Veterinary Medical Association, Dr. James L. Palotay, Greeley, Colo., discussed shipping fever in feedlot cattle (with illustrations). Dr. Ben Shambaugh, Jr., Burlington, led the discussion which followed. The motion picture "Protecting Poultry Profits" was also shown.

s/K. M. CURTIS, *Resident Secretary*.

Central Kansas Association.—The Central Kansas District Veterinary Medical Association met on September 7 in the English Room of the Broadview Hotel in Wichita. Mr. A. G. Pickett, state livestock sanitary commissioner, discussed vesicular exanthema in the state; Dr. Joe F. Knappenberger of Ashe Lockhart, Inc., Kansas City, presented a paper on problems encountered in bovine practice. The chairman, Dr. Melvin F. Scoby, of McPherson, moderated the spirited discussion which followed.

The group, composed of some 33 veterinarians and their wives, met for a steak dinner prior to the meeting.

s/K. M. CURTIS, *Resident Secretary*.

Southeast Kansas Association.—On August 28, the Southeast Kansas District Veterinary Medical Association met in Lone Chief Cabin,

Riverside Park, Independence, to hear **Dr. Duane R. Peterson**, head of the Department of Anatomy, Oklahoma A. & M. College, Stillwater, discuss regional nerve blocking for various surgical procedures. He also showed slides of animals on which neurectomies had been performed to demonstrate various nerve paralyses.

Following the meeting, the Independence veterinarians, Drs. Joe T. McGinity, C. A. Pyle, and H. G. Stephenson, treated the 30 visiting veterinarians to a watermelon feast.

s/K. M. CURTIS, *Resident Secretary*.

Kentucky

Personal.—Dr. W. M. Coffee, LaCenter, has suffered an aggravation of his eye trouble. He entered a St. Louis hospital about September 10 for more surgery. At that time, he was totally blind in his right eye and had a partial detachment of the retina of the left eye.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Association was held Sept. 17, 1952, at the Town Hall Grill in Springfield. Speakers of the evening were: **Drs. Harrison B. Siegle**, Dedham, and **Ray F. Witt**, Worcester, who discussed practical treatment of canine and feline dermatoses; and **Dr. Charles M. deVarennes**, Quincy, who presented a paper on the use of sodium propionate as an adjunct in the treatment of acetoneemia in cows.

s/C. LAWRENCE BLAKELY, *Secretary*.

Michigan

State Association.—The Michigan State Veterinary Medical Association met in the Durant Hotel, Flint, on Aug. 19-20, 1952, with a registration of 186.

The following speakers appeared on the program: **Drs. Jack Fries**, Durand; **Louis Newlin**, Romeo; **Allan Begg**, Marshall; **Henry Eames**, Manchester; **Arle Schneider**, Vicksburg; **William Mackie**, Lapeer; **Frank Thorp, Jr.**, Michigan State College, East Lansing; **Richard L. Rudy**, Ohio State University, Columbus; **Harry Shipman**, Ann Arbor; **Sherman Curell**, Midland; **Kenneth Harris**, Fenton; **Morris Hathaway**, Davison; **Richard Lannen**, Elsie; **Roland Humerickhouse**, Twining; **J. A. Williams**, Michigan State College; **Stephen Kelly**, Detroit; **Fred Gasow**, Birmingham; **Charles Hodder**, Detroit; **Costas Alvanos**, Toledo, Ohio; and **Wade Brinker**, Michigan State College.

The new officers of the Association are: **Drs. F. M. Lamoreaux**, Grand Rapids, president; **W. O. Brinker**, East Lansing, president-elect; **L. R. Newlin**, Romeo, first vice-president; **P. J. Babich**, Flint, second vice-president; **K. H. Fraser**, Niles, third vice-president; and **P. V. Howard**, Grand Rapids, secretary-treasurer.

s/GLEN REED, *Retiring Secretary*.

Minnesota

Southern Society.—The Southern Minnesota Veterinary Medical Society held its fall meeting at the Austin Country Club on September 24. **Dr. R. P. Hanson**, associate professor of veterinary science, University of Wisconsin, Madison, spoke on dissemination of vesicular diseases; and **Dr. E. H. Nordstrom**, field inspector of the U. S. Bureau of Animal Industry, discussed vesicular exanthema.

s/G. A. YOUNG, *Secretary*.

Mississippi

Southern V.M.A. to Meet in Jackson, November 17-19.—The thirty-fifth annual convention of the Southern Veterinary Medical Association to be held at the Heidelberg Hotel in Jackson, Nov. 17-19, 1952, will present an excellent program of scientific papers on a wide range of topics by authorities in various fields of veterinary medicine and surgery. Topics selected by the program committee include most of the important problems and developments of current interest to veterinary practitioners, involving both large and small animals, and presented by some 20 nationally known speakers. In addition, an attractive schedule of entertainment has been arranged. All veterinarians and their wives are cordially invited to attend.

s/VERNON D. CHADWICK, *Publicity Chairman*.

New Hampshire

New England Association.—The annual meeting of the New England Veterinary Medical Association was held Oct. 5-7, 1952, at the Mount Washington Hotel, Bretton Woods, in the heart of the White Mountains.

The following speakers appeared on the scientific program: **Drs. A. Gordon Danks**, Ithaca, N. Y.; **A. Henry Craigie, Jr.**, Indianapolis, Ind.; **James H. Gillespie**, Ithaca, N. Y.; **David L. Coffin**, Boston; **John H. Whitlock**, Ithaca, N. Y.; **Sidney W. Stiles**, Portland, Maine; **James Farquharson**, Fort Collins, Colo.; **P. R. Kendall**, Winchester, Mass.; **Frederick A. Erb**, North Haverhill, N. H.; **Jack I. Denton**, Middlebury, Vt.; **Mark W. Allam**, Philadelphia; **Walter R. Krill**, Columbus, Ohio; **Jacques Jenny**, Philadelphia; **George Hopson**, Milbrook, N. Y.; **John L. McAuliff**, Cortland, N. Y.; **David L. Hopkins**, Brattleboro, Vt.; **Dana H. Lee**, (B.V.Sc.), Lancaster, N. H.; and **Niel W. Pieper**, Middletown, Conn.

Dr. W. L. Boyd, St. Paul, Minn., president of the AVMA, was the banquet speaker.

s/FORREST F. TENNEY, *President*.

North Carolina

Central Association.—The Central Carolina Veterinary Medical Association met at the High Point City Lake for the annual picnic meeting. About 71 members, their families, and visitors were present.

Preceding the picnic, the executive committee and the board of examiners held a business meeting.

S/CLYDE W. YOUNG, *Secretary*.

Nova Scotia

Provincial Association.—The Nova Scotia Veterinary Association held a business meeting in Truro on Aug. 13, 1952, at which the following officers were elected: Drs. J. E. MacLean, Halifax, president; H. A. Carruthers, Antigonish, vice-president; R. McG. Archibald, Truro, secretary-treasurer; and executive members J. H. Scott, Port Williams; and J. G. Purdy, Amherst.

S/R. MCG. ARCHIBALD, *Resident Secretary*.

Ohio

Death of Dr. Burriss.—Dr. James T. Burriss (OSU '31), 46, Columbus, died of a heart attack on July 29, 1952. He was affiliated with the Columbus Serum Company, where he had completed fourteen years of service and was president and general manager when he resigned in June, 1952. A short time before his death, he had become associated with Jensen-Salsbery Laboratories.

Dr. Burriss, always a willing, active, well-liked, and respected member, was serving as president of the Ohio State Veterinary Medical Association during 1952, and was serving his second year as president of the Grand Council of the Omega Tau Sigma fraternity.

Some other affiliations of Dr. Burriss's were: U. S. Livestock Sanitary Association, Columbus Chamber of Commerce, Associated Serum Producers, the Big Brothers Association, and the AVMA. Dr. Burriss was one of those rare individuals who not only belonged, but took an active part in the organizations with which he was associated.

His loss will be mourned by all Ohio veterinarians, most all of whom he knew intimately. He was a true friend, counselor, and source of information concerning the veterinary profession in Ohio to Ohio veterinarians.

He is survived by his widow, Reda W., and two sons, Bruce and J. Don.

S/F. J. KINGMA.

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Northwestern Association.—The forty-fifth annual meeting and clinic of the Northwestern Ohio Veterinary Medical Association was held August 13 at the Lugbill Sales Barn in Archbold. Dr. Russell J. Beamer, Cleveland, conducted the small animal clinic; Dr. Earnest S. Weisner, Goshen, Ind., the poultry clinic; and Dr. Vernon Sharp, Columbus, the cattle clinic. Drs. R. W. Carter and D. A. Hill, Columbus, presented a paper on common problems encountered in conducting the plate agglutination test.

S/DAVID O. JONES, *Resident Secretary*.

Dr. Hay Named New Animal Industry Head.—Dr. John R. Hay (OSU '39) was named chief of the Ohio Animal Industry Division of the Department of Agriculture on Oct. 1, 1952, to succeed Dr. H. G. Geyer (OSU '36) who had served in this capacity for five years.

Dr. Hay had a degree in bacteriology before entering the school of veterinary medicine and took graduate work after completing his professional education.

He also served in the U. S. Navy during World War II and is still a member of the naval reserve. Since the war, he has practiced in Chillicothe, Ohio. Dr. Hay has been active in the affairs of the Ohio State Veterinary Medical Association, is at present chairman of the public relations committee, and was recommended by the association's executive committee.

Dr. Geyer has accepted a position as manager of the Columbus branch of the Jensen-Salsbery Laboratories, Inc.

Oregon

New Diagnostic Laboratory.—The new animal diagnostic laboratory at Oregon State College, Corvallis, began full scale operations in August. The Oregon State College, the Oregon Livestock Association, and the Oregon Veterinary Medical Association have agreed to a fee of \$4 for each laboratory examination. The income will be used to pay operating expenses. Dr. L. R. Vawter is in charge.

Pennsylvania

State Association.—The seventieth annual convention of the Pennsylvania State Veterinary Medical Association was held at Pocono Manor on Oct. 8-10, 1952.

The following speakers presented papers on the scientific program: Drs. Harlen E. Jensen, Cleveland, Ohio; S. F. Scheidy, Drexel Hill; Raymond C. Snyder, Upper Darby; Jacques Jenny, Philadelphia; Howard A. Milo, director of the state BAI, Harrisburg; Joseph F. Skelly, Chester; John T. McGrath, Drexel Hill; James H. Mark, Bryn Mawr; Mark W. Allam, acting dean, University of Pennsylvania School of Veterinary Medicine; Frantisek Kral, Philadelphia; S. J. Roberts, New York State Veterinary College, Ithaca, N. Y.; E. L. Stubbs, Philadelphia; Carroll K. Mingle, Washington, D. C.; Guy M. Graybill, Harrisburg; Charles J. Hollister, Montrose; W. E. Logan, Harrisburg; J. Lewis Williams, Uniontown; and John D. Beck, Philadelphia.

S/RAYMOND C. SNYDER, *Secretary*.

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Bucks-Montgomery Association.—The Bucks-Montgomery Veterinary Medical Association met at the Sharp and Dohme Medical Research Laboratories, West Point, on Sept. 17, 1952.

Drs. Bettylee Hampil and S. F. Scheidy, of Sharp and Dohme, discussed rabies.

s/VINCENT W. RUTH, *Secretary.*

Keystone V.M.A. Picnic at New Bolton Farm.—On Sept. 21, 1952, about 60 members, and their families, of the Keystone Veterinary Medical Association enjoyed a picnic at the New Bolton Center, University of Pennsylvania Farm, near Kennett Square, Pa. A tour to the three farm units and inspection of the clinic and research buildings was made. Following the tour a fine picnic lunch was enjoyed on the beautiful spacious lawn-at the mansion.

s/S. F. SCHEIDY.

New Castle County Association.—On September 11, the New Castle County Veterinary Association held its first meeting of the fall. **Dean Mark W. Allam**, of the University of Pennsylvania School of Veterinary Medicine, spoke of the changes in the staff and other items of interest at the University; and **Dr. J. D. Beck**, also of the University staff, told of the plans for the operation of the New Bolton Center as a part of the School of Veterinary Medicine.

s/E. F. WALLER, *Resident Secretary.*

Location of Pennsylvania Graduates.—The School of Veterinary Medicine, University of Pennsylvania, has compiled some interesting statistics. Of the 806 veterinarians who have graduated in the twenty-one years of 1931 to 1951, 465 (57%) were residents of Pennsylvania before matriculating. Of these home-state boys, 276 (59%) are now practicing or in other veterinary pursuits in that state. Of the entire 806 graduates, 309 (38%) are in veterinary occupations in Pennsylvania, 468 (58%) are in veterinary occupations outside of Pennsylvania, and 29 (3.6%) are deceased or inactive.

Dr. Topping Appointed Head of Medical Affairs at University.—President Harold E. Stassen announced, on September 6, the appointment of Dr. Norman H. Topping (M.D.) of the U. S. Public Health Service as vice-president in charge of medical affairs at the University of Pennsylvania, effective Nov. 1, 1952.

Prior to accepting the appointment, Dr. Topping was associate director of the National Institutes of Health at Bethesda, Md., a research branch of United States Public Health Service, and assistant surgeon general of the Public Health Service. He received his medical degree from the University of Southern California in 1936 and entered the Public Health Service the same year. He is recognized as an authority in the fields of research on typhus, Rocky Mountain spotted fever, and the entire field of viral and rickettsial diseases.

As administrator of the University's medical

program, Dr. Topping will be in charge of all medical, dental, and veterinary educational and research activities.

American Pharmaceutical Association Celebrates Centennial.—Founded in Philadelphia in 1852, the American Pharmaceutical Association returned there for its centennial convention which was held at the Bellevue-Stratford Hotel, Aug. 17-22, 1952. A special ceremonial session was held on August 20 to which were invited representatives of foreign and domestic organizations in all fields related to pharmacy and medicine.

Twenty foreign and more than 80 domestic organizations participated in the ceremonies on August 20. The American Veterinary Medical Association was represented by Brig. Gen. J. A. McCallam, president-elect, who presented formal greetings on behalf of the Association.

Texas

New Association.—The Coastal Bend Veterinary Association was formed on Aug. 13, 1952. Dr. C. K. Jones, Kingsville, was elected president and Dr. J. E. Hoban, Corpus Christi, secretary-treasurer.

Others present at the organizational meeting were Drs. W. W. Judson, J. E. Habluetzel, Paul Brandes, Ben Clyatt, Marvin Prewitt, and S. R. Dunn, all of Corpus Christi, and Dr. Cliff Harrel of Robstown. Regular monthly meetings will be held on the second Wednesday of each month.

s/J. E. HOBAN, *Secretary.*

Officers of Southeast Association.—The new officers of the Southeast Veterinary Medical Association are Drs. Max A. Pachar, Orange, president; Eugene Dillon, Beaumont, vice-president; and Glenn Butler, Beaumont, secretary-treasurer.

s/GLENN BUTLER, *Secretary.*

State Office Moved to College Station.—The central office of the State Veterinary Medical Association of Texas has been moved from New Braunfels to College Station and is located in the veterinary anatomy building on the A. & M. College campus.

Some of the advantages to the new location are close contact with the graduate students of the School of Veterinary Medicine and an opportunity for many contacts which would not be possible elsewhere. It is believed that the Association will be better able to serve the new graduates in becoming active in their professional organization.

Personals.—Dr. A. A. Price (TEX '49) is the new executive secretary of the Texas Veterinary Medical Association. He succeeds Dr. E. A. Grist, who was elected to life membership in the association as an award for his eight

years of service as secretary and as editor of the *Texas Veterinary Bulletin*.

During the illness of Dean I. B. Boughton of the School of Veterinary Medicine at Texas A. & M. College, Dr. F. P. Jaggi, head of the Department of Veterinary Hygiene, is acting dean. Dr. Boughton is reported to be making a steady recovery.

Washington

South Puget Sound Association.—On Aug. 7, 1952, members of the South Puget Sound Veterinary Medical Association met at the "Top-of-the-Ocean" in Tacoma to pay tribute to the pioneer veterinarians of the state. About 70 were present, including the honored veterinarians, association members, guests, and wives.

Present for the occasion were Drs. J. E. McCoy, dean, College of Veterinary Medicine, State College of Washington; E. C. Stone, dean-elect; E. E. Wegner, dean from 1919 to 1947; and pioneer veterinarians from nearly all parts of the state.

A cocktail hour in the Ocean Room was followed by an appetizing smorgasbord dinner. President **Marlowe Jones** then introduced **Dr. Stone** who spoke on the contributions made to veterinary science by the pioneers of the profession. **Dr. Wegner**, who was master of ceremonies, planned the program on the theme "Now It Can Be Told" as he called on the honored guests to relate their experiences. Many an interesting anecdote was told of the horse-and-buggy days. Adjournment at 11 p.m. was followed by dancing and visiting.

S/IRWIN ERICKSON, *Secretary*.

West Virginia

Kyowva Association.—Dr. B. H. Willet, 5721 Davis Creek Rd., Huntington, was appointed secretary-treasurer of the Kyowva Veterinary Medical Association on the resignation of Dr. Karl Mayer who had served in that capacity since the Association was formed.

S/KARL MAYER, *Retiring Secretary*.

Dr. Hershey Featured in Charleston Gazette.—"Dr. Hershey Among Pioneers who Raised 'Vet' Standards" is the title of a lengthy article appearing in the *Charleston Gazette* for Sunday, Aug. 31, 1952. The story tells of the uphill fight for healthy livestock and the part Dr. S. E. Hershey (QU '98; STJ '20) and other pioneer veterinarians played in checking such diseases as rabies, foot-and-mouth disease, tuberculosis, and other diseases which threatened the human population as well as the economic status of the livestock industry. Dr. Hershey was a charter member of the West Virginia Veterinary Medical Association and has been a member of the AVMA for forty years.

Personals.—Dr. S. O. Fisher (CIN '17), Charleston, is recovering from an operation for the removal of cataracts from his eyes.

Dr. C. F. Hale (API '44), Beckley, and Dr. Gordon Phillips (UP '46), Charleston, have reported for induction in the Army.

S/S. E. HERSHEY.

FOREIGN NEWS

Austria

WHO Seminar on Zoonoses.—The WHO Regional Office for Europe, jointly with FAO, will hold a seminar on zoonoses in Vienna on Nov. 24-29, 1952. Twenty-three countries from the European Region will participate.

Some of the subjects to be considered at the seminar are rabies, brucellosis, leptospirosis, Q fever, and bovine tuberculosis. The following are scheduled to present papers or act as discussion leaders: **Dr. Pierre Lépine**, Pasteur Institute, Paris; **Dr. M. M. Kaplan**, chief veterinary officer for WHO headquarters, Geneva; **Dr. A. W. Stableforth**, Weybridge, England; **Sir Thomas Dalling**, of the FAO; **Dr. J. W. Wolff**, Royal Institute for the Tropics, Amsterdam, Netherlands; **Dr. B. Babudieri**, Istituto Superiore di Sanità, Rome; and **Dr. J. N. Ritchie**, chief veterinary officer, Tolworth, England.

S/ERIK HOLAGER, *Veterinary Officer, WHO Regional Office for Europe*.

French Cameroun

Veterinary Medicine in the French Cameroun.—On accepting the appointment of foreign corresponding secretary of the AVMA for the French Cameroun, Dr. Muriel O. Roe (COR '49) says: "This is an interesting and changing country and presents many unsolvable problems to the veterinarian. In our mission work, we have carried on some small projects with cattle and chickens in areas where they have not been able to exist hitherto. The African has a protein-deficient diet and we hope that in some way we may be able to help him to better his health by improved food supply."

Indonesia

The Institute of Physiology at Bogor.—The scientific center for the tropics and southeastern Asia located at Bogor, Indonesia, has been established for many years. A new institute for physiology was added in May, 1949. It first operated in a bacteriological laboratory built by the Japanese during their occupancy. Now, a new modern laboratory has been added. In addition to teaching and research in veterinary physiology, some work is done in physiology of human beings. Several research projects are now underway and one, on the hema-

tology of the Zebu, has already been completed.

Peru

New Dean of Veterinary School.—Dr. Teodoro Ramos Saco was recently elected dean of the veterinary school of San Marcos University, Lima, succeeding Dr. José Santivanez who resigned in June. Dr. Ramos Saco is a graduate of the School of Veterinary Medicine, University of Pennsylvania, where he obtained his V.M.D. degree in 1946. He has been a member of the faculty since the Lima school was founded and has been in charge of the ambulatory clinic and the courses in parasitology and poultry diseases.

Philippine Islands

Philippine Veterinarians Attend India Rabies Conference.—Dr. Lope M. Yutuc, assistant professor and head, Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of the Philippines, and Dr. Anacleto B. Coronel, virologist, Bureau of Animal Industry, and professorial lecturer in the above College, were two of the three representatives from the Philippine Republic to the Tri-Regional Rabies Conference for a fortnight in July at the Pasteur Institute, Coonoor, India.

This conference was sponsored by the World Health Organization. Experts from three

WHO Regional Organizations, the eastern Mediterranean, South East Asia, and the western Pacific, participated in this conference.

s/JOSÉ B. ARANEZ,
Foreign Corresponding Secretary.

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Dr. Uichanco Is Research Scholar at National Institutes of Health.—Dr. José B. Uichanco,



Dr. José B. Uichanco

assistant professor of veterinary pathology and bacteriology, and secretary of the faculty of the

Rabies in Malaya



—United Press Photo
Two Chinese children watch as their dog is vaccinated against rabies in Kuala Lumpur, Malaya, where a drive against rabies is in progress.

College of Veterinary Medicine, University of the Philippines, will work as a research scholar at the National Institutes of Health, Bethesda, Md., under Dr. George Hottle of the Laboratory of Biological Control. He will also visit and work in other well-known laboratories and veterinary colleges in the United States. Dr. Uichanco is a recipient of a U. S. Government grant under the Fulbright and Smith-Mundt acts, and a fellowship from the University of the Philippines.

S/JOSE B. ARANEZ,
Foreign Corresponding Secretary.

VETERINARY MILITARY SERVICE

The Officer May Be a Lady.—Announcement is made in Bulletin 12 (Aug., 1952), Department of the Army, that all laws which authorize the appointment of officers to the Regular Army, Navy, or Air Force, or to their Reserve components, to perform medical, dental, or veterinary service, shall be construed as authority to appoint female as well as male officers. All laws applicable to male officers will be likewise applicable to female officers, except that the husband or children of these female officers can not be considered dependents unless they are so in fact.

• • •
Depot Veterinarian Decorated.—Major Herman Tax (COR '37) was cited for meritorious service in the combat zone in Korea from Aug. 30, 1950, to February 15, 1952, while stationed



Colonel George E. Hartman, commanding officer at the Schenectady General Depot, U. S. Army, congratulates Major Herman Tax, the depot's veterinary officer, upon receiving the bronze star medal.

at Pusan, as port veterinarian of the Seventh Transportation Major Port. Major Tax has been stationed at the Schenectady Army depot since March 22, 1952.

BIRTHS

Dr. (COL '43) and Mrs. Bryant B. Nisley, Gothenburg, Neb., announce the birth of twins, Jeffrey Bryant and Julie Jean, on April 16, 1952.

Captain (KSC '44), and Mrs. Neil C. Gustafson, Fort Riley, Kan., announce the birth of a daughter, Deborah Lue, on July 10, 1952.

Major (API '43) and Mrs. William D. Nettles, Donaldson Air Force Base, S. Car., announce the birth of Malcolm Suber, their fourth child, second son, on Aug. 16, 1952.

Dr. (TEX '43) and Mrs. E. G. Streetman, Nederland, Texas, announce the arrival of Charles Reed on Aug. 19, 1952.

Dr. (COL '35) and Mrs. R. S. Attaway, Yuba City, Calif., announce the birth of a son, John Ray, on Aug. 23, 1952.

DEATHS

A. P. Abendshein (KCV '17), 61, Turon, Kan., died on June 6, 1952. Dr. Abendshein had served for many years with the U. S. Bureau of Animal Industry. He had been a member of the AVMA.

Otto C. Alspach (GR '11), 67, Marion, Ohio, died July 23, 1952. A general practitioner, Dr. Alspach was a member of the Ohio Veterinary Medical Association and of the AVMA.

Thomas O. Anders (OSU '03), Seattle, Wash., died May 10, 1952. Dr. Anders had retired from practice several years ago.

Bryce B. Binnall (KCV '18), Baldwin Park, Calif., died (date unknown). Dr. Binnall had retired from practice some time ago.

Albert E. Bryant (OVC '93), Menomonie, Wis., died Aug. 7, 1952. Dr. Bryant was a general practitioner. He was admitted to the AVMA in 1911.

James T. Burriess (OSU '31), 46, Columbus, Ohio, died July 29, 1952. Dr. Burriess was a member of the AVMA. An obituary appears on page 415 of this JOURNAL.

William M. Carlisle (CVC '18), 59, Hickory, Pa., died Aug. 1, 1952, after being in ill health for some time. Dr. Carlisle worked for the Pennsylvania Bureau of Animal Industry and later practiced in Hickory as long as his health permitted. He is survived by his widow, a daughter, and two sons.

Dr. Carlisle was admitted to the AVMA in 1950.

Harold M. Clarvoe (USC '18), 62, Tampa, Fla., died April 25, 1951. Dr. Clarvoe was a general practitioner. He was a member of the Florida State Veterinary Medical Association, having served as its president in 1935, and was a member of the AVMA for several years. Dr. Clarvoe is survived by his widow.

George A. Cunningham (ONT '04), Lawton,

Okla., died in 1951. Dr. Cunningham was a general practitioner.

J. M. Dillenbeck (GR '10), 72, Carlinville, Ill., died July 25, 1952. Dr. Dillenbeck was employed by the U. S. Bureau of Animal Industry.

Glenn R. Dunning (GR '06), Memphis, Mich., died April 20, 1952. Dr. Dunning was a general practitioner.

Albert J. Erickson (WES '05), Tustin, Mich., died Oct. 27, 1951. Dr. Erickson was a general practitioner.

Benjamin W. Groff (OVC '98), 76, Massillon, Ohio, died in May, 1951. Dr. Groff is survived by his widow. He was a member of the Ohio Veterinary Medical Association and had been a member of the AVMA.

Ernest D. Harris (OSU '08), Fort Pierce, Fla., died Sept. 2, 1951. Dr. Harris had retired from general practice.

Harry Hedin (MCK '18), 62, East Grand Forks, Minn., died July 2, 1952, of injuries received in an automobile accident. Dr. Hedin had practiced in East Grand Forks for twenty-four years. He was admitted to the AVMA in 1919.

R. D. Holeman (KCV '17), 66, Enid, Okla., died Aug. 21, 1951, from a heart attack. Dr. Holeman is survived by his widow, two daughters, one granddaughter, and his mother.

Virgil R. Homan (IND '18), Sugar Grove, W. Va., died May 1, 1952. Dr. Homan was employed by the West Virginia State Department of Agriculture.

Charles C. Hooker (ONT '90), Oklahoma City, Okla., died in 1951. Dr. Hooker had retired.

Leo A. Hosbein (GR '12), Coloma, Mich., died July 7, 1952. Dr. Hosbein had retired.

William A. Jones (GR '15), 75, Johnson City, Tenn., died July 24, 1952. Dr. Jones is survived by his widow and a daughter. He was admitted to the AVMA in 1939.

Thomas W. Lennon, Jr. (API '40), 34, Parkersburg, W. Va., died Sept. 4, 1952, of virus pneumonia. After receiving his D.V.M. degree, Dr. Lennon joined the Veterinary Corps of the U. S. Army, where he attained the rank of captain. After his discharge, he practiced in Parkersburg. He is survived by his widow, a daughter, and a brother. Dr. Lennon was a member of the AVMA.

T. E. Lotz (CVC '13), Chadwick, Ill., died Dec. 31, 1951. Dr. Lotz is survived by his widow.

Ray Meier (STJ '18), 56, Smithville, Mo., died Aug. 4, 1952, of coronary hemorrhage while at work on the Ashe Lockhart laboratory farm in Platte County, Mo. Dr. Meier had been associated with Ashe Lockhart, Inc., since 1946 and was in charge of serum production. From 1934 to 1946, he was with the Bureau of Animal Industry and prior to that time he was in general practice in Smithville. He was a mem-

ber of the AVMA, the Missouri and Kansas City Veterinary Medical Associations, and numerous civic organizations. Dr. Meier is survived by his widow, two daughters, and his mother.

Rudolph H. Mohlenhoff (CVC '91), 82, Cleveland, Miss., died March 29, 1952. Dr. Mohlenhoff was admitted to the AVMA in 1919.

S. W. Neeley (OSU '27), 51, Toledo, Ohio, died Aug. 23, 1952. Dr. Neeley had been associated with the health department in Toledo for more than twenty years. He is survived by his widow and two sons. He had been a member of the AVMA.

Franklin L. Parse (IND '07), 77, Foxworth, Miss., died Sept. 6, 1952. Dr. Parse had practiced in Foxworth since 1913. He is survived by his widow, two brothers, and one sister.

John E. Randall (IND '13), Bunker Hill, Ind., died in August, 1952. Dr. Randall was a general practitioner.

John J. Repp (UP '98), 82, Philadelphia, Pa., died April 29, 1952. Dr. Repp had served as secretary of the AVMA from 1902 to 1906, at which time he received his M.D. degree from the University of Pennsylvania. He practiced as a physician until a short time before his death.

M. H. Rhoads (KCV '06), 73, Clarendon, Texas, died May 27, 1952. Dr. Rhoads was a veteran of World War I.

Ernest A. Shikles (CVC '11), 67, Dearborn, Mo., died June 27, 1952. Dr. Shikles was a former president of the Missouri Veterinary Medical Association. He is survived by his widow and two daughters. He was admitted to the AVMA in 1915.

Charles D. Skippon (GWU '16), Baltimore, Md., died (date unknown). Dr. Skippon is survived by his widow.

Milton Spiegel (COR '39), 55, Farmingdale, L. I., died of a heart attack on July 1, 1952. Dr. Spiegel was a member of the Long Island Veterinary Medical Association and had served as its president. He was admitted to the AVMA in 1939.

J. E. Stansbury (MCK '06), 75, Athens, Ohio, died on July 30, 1952. He was an honor roll member of the Ohio State Veterinary Medical Association. He is survived by his widow and two sons, Dr. (OSU '39) J. L. Stansbury of Marietta, Ohio, and Dr. (OSU '44) R. L. Stansbury of Pasadena, Calif., who is now in military service. Dr. Stansbury had been a member of the AVMA.

Edward H. Stearns (TH '12), New Milford, Conn., died recently. Dr. Stearns was a general practitioner.

Correction.—In the October, 1952, JOURNAL (p. 327), the obituary for Frank E. Davis was in error. The name should have been *Frank E. Blake*.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

University of Illinois conference for veterinarians. College of Veterinary Medicine, University of Illinois, Urbana, Ill., Oct. 24-25, 1952. Jesse Sampson, head, Department of Veterinary Physiology and Pharmacology.

Florida State Veterinary Medical Association. Annual meeting. George Washington Hotel, West Palm Beach, Fla., Oct. 26-28, 1952. Robert P. Knowles, 2936 N. W. 17th Ave., Miami, Fla., secretary.

Mississippi Valley Veterinary Medical Association. Annual meeting. Hotel Pere Marquette, Peoria, Ill., Oct. 28-29, 1952. A. C. Gathmann, 202 Front St., Galva, Ill., secretary.

United States Livestock Sanitary Association. Annual meeting. Hotel Seelbach, Louisville, Ky., Oct. 29-31, 1952. R. A. Hendershott, 1 West State St., Trenton 8, N. J., secretary. Copies of the Annual Proceedings of the U. S. L.S.A. are available at \$5 per copy.

Interstate Veterinary Medical Association. Annual meeting. Martin Hotel, Sioux City, Iowa, Oct. 30-31, 1952. E. G. Cole, 510 West 19th St., Sioux City 3, Iowa, secretary.

Association of Land-Grant Colleges and Universities. Annual meeting. Statler Hotel, Washington, D. C., Nov. 11-13, 1952.

Midwest Small Animal Association, annual meeting, and American Animal Hospital Association, regional meeting. Hotel Burlington, Burlington, Iowa, Nov. 12-13, 1952. J. Porter Coble, 2828 S. MacArthur Blvd., Springfield, Ill., secretary.

Southern Veterinary Medical Association. Annual meeting. Hotel Heidelberg, Jackson, Miss., Nov. 17-19, 1952. A. A. Husman, Raleigh, N. Car., secretary.

Animal Care Panel. Annual meeting. University of Illinois, Chicago Professional Colleges, Chicago, Ill., Dec. 3-4, 1952. Bennett J. Cohen, Northwestern University Medical School, 303 E. Chicago Ave., Chicago 11, Ill., secretary.

Maryland State Veterinary Medical Association. Annual winter meeting. Lord Baltimore Hotel, Baltimore, Md., Dec. 5-6, 1952. John D. Gadd, Cockeysville, Md., secretary.

Kentucky Veterinary Medical Association. Annual conference and short course. Animal Pathology Building, University of Kentucky, Lexington, Dec. 10-11, 1952. T. J. Stearns, Room 216, Livestock Exchange Bldg., Louisville, Ky., secretary.

University of Pennsylvania. Annual conference for veterinarians. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Jan. 6-7, 1953.

Ohio State Veterinary Medical Association. Annual meeting. Deshler-Wallick Hotel, Columbus, Ohio, Jan. 7-9, 1953. F. J. Kingma, Veterinary Laboratory, The Ohio State University, Columbus 10, Ohio, secretary.

New York State Veterinary College. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 7-9, 1953. W. A. Hagan, dean.

Oklahoma Veterinary Medical Association. Annual meeting. Pittmore Hotel, Oklahoma City, Okla., Jan. 12-13, 1953. Lewis H. Moe, Oklahoma A. & M. College, Stillwater, Okla., secretary.

Tri-State (Mississippi, Arkansas, Tennessee) Veterinary Medical Association. Annual meeting. Hotel Peabody, Memphis, Tenn., Jan. 12-14, 1953. W. L. Thomas, 906 Broadway, Little Rock, Ark., chairman.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 14-16, 1953. W. W. Garverick, Zionsville, Ind., secretary.

Ontario Veterinary Association. Annual meeting. Chateau Laurier Hotel, Ottawa, Ont., Jan. 14-16, 1953. R. V. L. Walker, 438 Piccadilly Ave., Ottawa, Ont., chairman.

Intermountain Veterinary Medical Association. Annual meeting. Newhouse Hotel, Salt Lake City, Utah, Jan. 19-21, 1953. H. F. Wil-

(Continued on p. 34)

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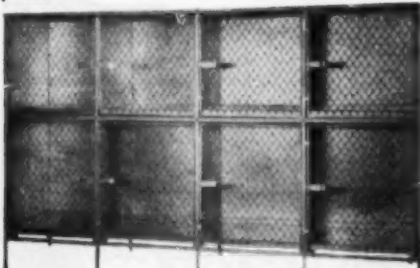
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(COMING MEETINGS—Continued from p. 32)

- kins, Montana Livestock Sanitary Board, Helena, Mont., chairman, program committee.
- Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 20-22, 1953. E. B. Young, Waukegan, Iowa, secretary.
- Michigan State College. Annual postgraduate conference for veterinarians. Michigan State College, East Lansing, Mich., Jan. 21-22, 1953. G. R. Moore, Department of Surgery and Medicine, chairman.
- Texas, State Veterinary Medical Association of. Annual meeting. Baker Hotel, Mineral Wells, Texas, Jan. 26-27, 1953. Al Price, 101 Veterinary Anatomy Building, College Station, Texas, executive secretary.
- Minnesota State Veterinary Medical Society. Annual meeting. Nicollet Hotel, Minneapolis, Minn., Jan. 26-28, 1953. B. S. Pomerooy, St. Paul 1, Minn., secretary.
- California State Veterinary Medical Association. Midwinter Annual meeting, Davis, Calif., Jan. 26-28, 1953. W. J. Zontine, 1014 Yucca Ave., Lancaster, Calif., program chairman.
- North Carolina Veterinary Conference. North Carolina State College, Raleigh, N. Car., Jan. 27-29, 1953. C. D. Grinnells, North Carolina State College, Raleigh, chairman.
- Illinois State Veterinary Medical Association. Annual meeting. Hotel Sherman, Chicago, Ill., Jan. 28-30, 1953. A. G. Misener, 6448 North Clark St., Chicago 26, Ill., secretary.
- Louisiana State University. Annual conference for veterinarians. Louisiana State University, Baton Rouge, La., Feb. 3-4, 1952. W. T. Oglesby, head, Department of Veterinary Science.
- Colorado A. & M. College. Annual conference for veterinarians. Colorado A. & M. College, Feb. 16-18, 1953. O. R. Adams, director of clinics.

(Continued on p. 36)



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(COMING MEETINGS—Continued from p. 34)

American Veterinary Medical Association. Annual meeting. Royal York Hotel, Toronto, Ont., July 20-23, 1953. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. Richard L. Stowe, 149 Otsego Ave., San Francisco, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month (except July and August) at Black's Tea Room, Waterloo. F. E. Brutsman, Traer, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. W. E. Smith, 516 Oatman, Sanger, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. Mr. Earl D. Adams, Greensboro, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Coastal Bend Veterinary Association (Texas), the second Wednesday of each month. J. E. Hoban, 4301 S. Port Ave., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. V. D. Ladwig, Sac City, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bi-monthly, the fourth Wednesday. Robert Clemens, 23352 Orchard, Hayward, Calif., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant.

(Continued on p. 38)

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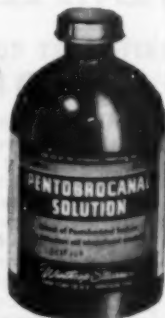
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- West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.
- Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.
- Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. George A. Franz, 3667a Marceline Terrace, St. Louis, Mo., secretary.
- Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.
- Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.
- Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.
- Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of

- each month, in Louisville or within a radius of 50 miles. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.
- Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. T. M. Eagle, Parkville, Route 2, Mo., secretary.
- Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. K. M. Curtis, 70 Central Ave., Kansas City 18, Kan., secretary.
- Kern County Veterinary Medical Association, the first Thursday of each month. Richard A. Stiern, 17 Niles St., Bakersfield, Calif., secretary.
- Keystone Veterinary Medical Association, the Philadelphia County Medical Society Building, 301 S. 21st Street, Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.
- Kyowva Veterinary Medical Association, the second Thursday of each month in the Hotel

(Continued on p. 40)

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American Veterinary Medical Association

600 So. Michigan Ave., Chicago 5, Ill.

(COMING MEETINGS—Continued from p. 38)

Prichard, Huntington, W. Va., at 8:30 p.m. Karl Mayer, 1531 Fourth Ave., Huntington, W. Va., secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from September through May, at the Academy of Medicine of Northern New Jersey, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month. Write M. L. Livingston, Hartford, Mich., secretary, for location.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. C. Edward Taylor, 2146 S. Broad St., San Luis Obispo, Calif., secretary.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. C. Edward Taylor, 2146 South Broad St., San Luis Obispo, Calif., secretary.

New Castle County Veterinary Society, the second Wednesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Harold Roberts, Paper Mill Road, Newark RJ, Del., secretary.

New York City, Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63 St., New York City. C. R. Schroeder,

(Continued on p. 42)

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ADDRESS

(COMING MEETING—Continued from p. 40)

Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday evening from September through June, at the Casa Mana Restaurant, Cedar Lane, Teaneck, N. J. Robert R. Shomer, 1680 Teaneck Road, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Tom Hagan, Gen. Del., Escalon, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. W. C. Schilb, 4312 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Clark Stillinger, 1742 E. Holt Ave., Pomona, Calif., secretary.

Orange County Veterinary Medical Association, bi-monthly. Donald E. Lind, 2643 N. Main, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. P. H. Hand, Box 1035, Millbrae, Calif., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. C. N. Copeland, Hickory, N. Car., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month, in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Robert L. Hawley, 1001 N. W. Fourteenth Ave., Portland, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. John McChesney, 40 6th St., Petaluma, Calif., secretary.

Roanoke-Tar (N. Car.) Veterinary Medical Association, the first Friday of each month, time and place specified monthly. B. H. Brow, Weldon, N. Car., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. S. M. Foster, 430 College, Woodland, Calif., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. H. W. Harper, Flint Health Department, Flint, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. Warren J. Dedrick, 904 S. Lemon, El Cajon, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary

(Continued on p. 44)

Day after day your professional advice
is asked on a variety of subjects—

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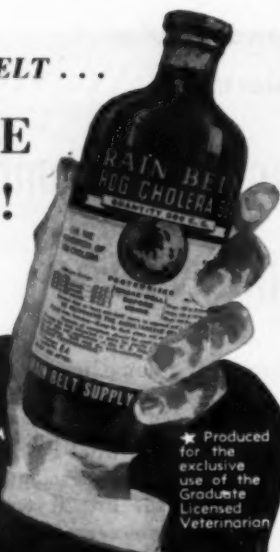


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Correspondence

Dear Dr. Van Houweling:

I acknowledge with thanks, receipt of your letter of July 29, 1952. . . .

I would be extremely happy to render . . . any service to the AVMA, of which I have had the honor of being a member for more than twenty years.

During these years—except for periods of disruption caused by wars—the JOURNAL of the AVMA has been a source not only of professional information but also of pleasure and satisfaction at following the tremendous development of the veterinary profession in the U.S.A. and the brilliant organizational work done by the AVMA.

Please . . . convey my compliments to the President of the AVMA.

With kind regards.

Yours sincerely,
s/HANS PEDERSEN (Hong Kong)
The Culty Dairy Co., Ltd.
Shanghai, China

(COMING MEETINGS—Continued from p. 42)

Medical Association, the second Friday of even months. Joe Ridgway, 1784 Thompson Blvd., Ventura, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. R. W. Sprowl, 11756 San Vicente Blvd., Los Angeles 49, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month at 7:30 p.m. in the Seven Seas Restaurant, Miami, Fla. E. A. Majilton, 1093 N. E. 79th St., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla. John Carnes, Muskogee, Okla., secretary.

Foreign Meetings

Fifteenth International Veterinary Congress. Stockholm, Sweden, Aug. 9-15, 1953. Dr. L. de Blicke, Soestdijkseweg 113N., Bilthoven, Netherlands, secretary, Permanent Committee. (U. S. Committee: Dr. W. A. Hagan, N. Y. State Veterinary College, Ithaca, N. Y., chairman; Dr. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., secretary.)

Successful Gland Grafts.—Rejuvenation by transplanting sex glands may still prove to be possible if glands from fetuses in the first half of gestation are used. The fetal glands do not stimulate formation of bothersome antibodies in the blood.—*Sci. News Letter*, April 5, 1952.



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Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

WANTED VETERINARIAN—to assist in a busy mixed practice. Good salary and possible future for a man who is willing to do the high caliber job a discriminating clientele demands. Recently built hospital with complete facilities for small and large animal surgery. Address "Box Z 1," c/o JOURNAL of the AVMA.

WANTED—young enterprising veterinarian with California license, small animal practice in well-established veterinary hospital. Good salary and working conditions. Address Dr. F. H. Saunders, 336 E. Lafayette St., Stockton 3, Calif.

(Continued on p. 48)

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Ken-L-Biskit contains all the rich, life-giving proteins, vitamins, minerals, and other nutrients known to be essential to top health. And only Ken-L-Biskit contains Nurgene, nature's wonder-vitamin ingredient and chlorophyll—plus real meat meal.

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Ken-L-Biskit's new "controlled moisture" process insures the same minimum moisture content . . . faster, more uniform absorption of liquids for easier mixing.

Interested in control of offensive dog odors?

If so, you will be glad to know that Ken-L-Biskit now contains odor-ending chlorophyllin. Tests show the natural breeding habits of dogs are in no way affected by this chlorophyllin content.

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Indications—Constipation in various sections of the digestive tract in all domestic animals; rumen paresis and indigestion in cattle; various types of colic in horses. In herbivorous animals the reaction of the urine is changed from alkaline to acid, thus aiding the action of drugs such as urotropin in urethritis and cystitis.

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COECOLYSIN, produced by a leading European veterinary laboratory, has been extensively tested. It is furnished in sterile form for injection of horses, cattle, and small animals.

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(CLASSIFIED ADS — Continued from p. 46)

WANTED VETERINARIAN—experienced in small animal practice. State full qualifications in first letter. Replies confidential. Dr. James E. Patterson, 3800 Grand River Ave., Detroit 8, Mich.

VETERINARIAN WANTED—opportunity for practitioner interested in active race track practice. Will work with man until established. Retiring, ill health. Address "Box Y 11," c/o JOURNAL of the AVMA.

WANTED VETERINARIAN—as assistant. Excellent clientele and large practice. Salary commensurate with willingness and ability. Dr. R. A. Self Veterinary Hospital, 800 N. Oak Cliff Road, Dallas, Texas.

The state of Indiana has expanded its program in Brucellosis control. There are several new positions for veterinarians to act as field supervisors. Starting salary \$4,500 plus \$7.20 per diem, and 6 cents mileage. Apply: Dr. James B. Henderson, Assistant State Veterinarian, State Board of Health Building, 1330 W. Michigan St., Indianapolis, Ind.

WANTED VETERINARIAN—as assistant in Midwest, three-man, large and small animal practice. Large animal predominately dairy. Hospital accommodates 80 patients. Good salary, plus commission. State experience and qualifications in first letter. Address "Box A 1," c/o JOURNAL of the AVMA.

(Continued on p. 50)

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WANTED GRADUATE VETERINARIAN—qualified to take over County public health meat control program. Bureau of Animal Industry post-mortem and antemortem experience necessary. Starting salary \$4,476, with yearly increments for a maximum of \$4,850. Six cents per mile for official travel. Two weeks' vacation, sick leave, and liberal disability and retirement benefits. Give age, experience, references and other particulars when answering. Permanent position. Address "Box A 7," c/o JOURNAL of the AVMA.

WANTED VETERINARIAN—assistant for small animal practice located in the Midwest. Preferably single man. Starting salary \$100 a week and living quarters furnished for single man. Address "Box A 8," c/o JOURNAL of the AVMA.

Remittance must accompany order

WANTED—young, experienced small animal veterinarian to work small animal hospital in Florida. Must have Florida license. Address "Box A 10," c/o JOURNAL of the AVMA.

WANTED—Maryland licensed veterinarian to operate small animal hospital. Small apartment available. Address "Box A 18," c/o JOURNAL of the AVMA.

WANTED—graduate veterinarian for public health meat control. Experience in meat inspection preferred, but not essential. Annual starting salary \$3,934, with yearly increments, giving maximum \$4,275. Two weeks' vacation, sick leave, and liberal disability and retirement benefits. Give age, experience, references and other particulars when answering. Permanent position, Jefferson County Board of Health, Birmingham, Ala.

(Continued on p. 52)

Dr. Gray Appointed Director of Fort Dodge Biological Laboratory

Dr. B. J. Gray (ISC '43) has been appointed director of the biological laboratories of Fort Dodge Laboratories, Inc., Fort Dodge, Iowa. He succeeds to the position held since 1919 by Dr. H. J. Shore, who died on June 19. Dr. Gray has also been made a director of the company. He joined the Fort Dodge staff as diagnostician in 1944 and was subsequently assigned to assist Dr. Shore in the operation of the biological laboratory.

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Authoritative information on the scientific care and feeding of dogs. **No. 16**
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DOG RESEARCH NEWS

Table Training for the Puppy

Table training, one of the first steps in teaching obedience, consists in placing the puppy on a table with a non-skid surface.



Early table training helps the puppy grow into a happy, well-adjusted dog.

Slip a headstall over the puppy's head. A headstall can be made from a short piece of rope or leather with a ring at the end so that a loop can be made to fit snugly around the puppy's neck. The upper end of the headstall is then attached to an object overhead so that the puppy's head will be held up.

This teaches the puppy to pose so that the owner can easily groom the coat, check teeth, trim toenails, or train for general handling. Table training should be followed by lead training and other forms of obedience training.

Vomiting

First Aid for vomiting - vomiting that is not associated with habit in certain dogs - should consist in keeping the patient warm, dry, and quiet.

Solid foods should be withheld, and when food is given it should consist of liquids such as milk.

If milk is not taken readily, or is vomited, use whites of eggs that are well beaten, or ice water. Sometimes a small cube of ice forced down the throat will work satisfactorily. Three and a half to seven grains of aspirin, depending on the size of the dog, may reduce the vomiting.

Hot water or heat applied to the abdomen will often afford some relief. Of course, if vomiting persists, a veterinarian should be consulted.



In cases of digestive disturbance the dog should be kept warm, dry, and quiet.

Naturally, one of the main factors in keeping a dog's digestive system in good order is a proper diet such as a reputable commercial dog food like Friskies. Friskies is scientifically balanced to contain all the elements a dog is known to need to promote good health and sound digestion.

HAVE A QUESTION? Write Friskies, Dept. Y, Los Angeles 36, California.

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WANTED EXPERIENCED VETERINARIAN—for busy, high-class small animal hospital located in one of Connecticut's wealthiest towns. Must be ambitious, capable, and not afraid of work and long hours as this is not solely a job but an opportunity for the right man to obtain a partnership here in the very near future. Write full history and professional experience to Dr. Harold T. Rose, Darien, Conn.

WANTED VETERINARIAN—as assistant in Midwest mixed practice. Good salary with commission. Modern home available. Address "Box A 20," c/o JOURNAL of the AVMA.

VETERINARIAN—to supervise and direct a municipal Meat Control Service. Preferably with a master's degree in Public Health. Should have at least five years' practical experience in meat inspection, at least two of which are in a supervisory capacity. Should be capable of correlating local Meat Inspection Service with a well-rounded veterinary public health program. Candidate should not have passed his forty-fifth birthday. Salary range — \$6118.80 to \$6776.40 per year. Apply Municipal Civil Service, Department of Personnel, Room 235 Municipal Courts Building, St. Louis 3, Mo.

Wanted—Positions

European veterinarian, 44 years old, looks for a

job. AVMA-approved school, first papers. Address "Box A 4," c/o JOURNAL of the AVMA.

Young veterinarian, single, graduate of Swiss veterinary college, four years' experience in mixed practice, seeks position. Address "Box A 11," c/o JOURNAL of the AVMA.

Veterinarian and Pharmacist, licensed for both in New York State, desires contact in practice, institutional, or commercial enterprise upon separation from Army in May, 1953. Address "Box A 24," c/o JOURNAL of the AVMA.

POSITION WANTED—responsible, experienced veterinarian desires position as assistant in mixed or small animal practice leading to partnership or purchase. Competent, ambitious, large and small animal experience. West coast preferred. Address "Box A 14," c/o JOURNAL of the AVMA.

POSITION WANTED—recent graduate of AVMA-approved school, presently employed BAI, desires position as associate, with possibility of full partnership later, in mixed practice preferably in the South. New car and equipment for large animal work. Licensed in Alabama and Mississippi. Some experience in private practice. Protestant, white, married, children. Draft status satisfactory. Address "Box A 12," c/o JOURNAL of the AVMA.

(Continued on p. 56)



CALPHOSAN®

¹Hoffman, R. H. and Abrahamson, E. M.; A Solution for Parenteral Administration of Calcium, Amer. J. Dig. Dis.

²Burbank, R.; Pers. Comm., July 20, 1950.

³Lubowe, I. I.; N. Y. Phys., Vol. 36, No. 3, 1951.



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2nd Lt.
Joseph C. Rodriguez
U.S. Army
Medal of Honor



SIXTY YARDS TO GO. From atop the hill, near Munye-ri, Korea, the enemy suddenly opened up a withering barrage. The squad was caught; Red mortars began zero-ing for the kill. Lieutenant Rodriguez (then Pfc., with only seven months service) broke loose and dashed up the fire-swept slope, throwing grenades. Disregarding the fire concentrated on him, he wiped out three foxholes and two gun emplacements. Alone, he accounted for 15 enemy dead, led the rout of the enemy, and saved the lives of his squad.

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**COMPARATIVE RESULTS OF 3 GONADOTROPES FOR TREATMENT OF
CYSTIC OVARIES CAUSING NYMPHOMANIA IN CATTLE**

Treatment	Dose	No. of Cows	Recovered and Conceived	Recovered and Sterile	Recovered (but outcome unknown)	Relapsed	No Results	Per Cent Recovery	Per Cent Conceived*
Follutein ¹	10,000 I.U.	28	23	3	3	1	0	96.4%	85.1%
Sheep Pituitary	1.2 gms. equiv. sheep pituitary	38	19	7	4	6	2	78.8%	50.0%
Preg. Mare Serum	1500 - 3000 R.U.	14	5		1		8	42.9%	38.3%

*This is based on the cases where the outcome is known.

¹ Supplied by E. R. Squibb & Sons, New York City

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In the treatment of

CYSTIC OVARIES

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The results of treatments with Squibb Follutein and two other products—dried sheep pituitary extract and pregnant mare serum—are shown in the box on the opposite page.

In reference to these treatments, an Annual Report¹ of the New York State Veterinary College at Cornell has this to say:

"All three products have value and have been employed in cystic ovaries in cattle but chorionic gonadotropin (Follutein) in our short uncontrolled experiments has been exceptionally useful, provided no serious pathology existed other than cystic ovaries."

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*Trademark ¹1946-47, Number 27A, pages 113-114

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*Schalm, O. W., and Ormbee, R. W.: J. A. V. M. A., 115:464 (Dec.), 1949.



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(CLASSIFIED ADS — Continued from p. 52)

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WANTED—good small animal or mixed practice by experienced veterinarian returning from army service. Preferably Midwest. Address "Box A 19," c/o JOURNAL of the AVMA.

WANTED TO BUY—active small animal or mixed practice, or association leading to ownership. Licensed in Conn., Mass., Ohio, Ind., Mich., Ill. Experienced. Married. Address "Box A 21," c/o JOURNAL of the AVMA.

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(Continued on p. 57)



Dr. James E. Cook (OKL '51) (left) is now in charge of production of hog cholera vaccine at the Jen-Sal Laboratories, Kansas City, Mo. Previously specializing in pathology, Dr. Cook taught veterinary pathology for a year at Oklahoma A. & M. before joining Jen-Sal Laboratories.

Dr. Max Sutter (KSC '51) (right) recently joined the staff of the Jen-Sal Laboratories; he will assist Dr. A. H. Quin, director of professional service, and will also be in charge of clinical testing of new Jen-Sal products.

(CLASSIFIED ADS — Continued from p. 56)

FOR SALE OR LEASE—with option to buy. Southern California small animal hospital now at one man capacity. No real estate. Low price, lenient terms. Address "Box W 17," c/o JOURNAL of the AVMA.

FOR SALE—due to death, veterinary hospital doing wonderful business. Other income with building. Or veterinarian with Calif. license to work. Mrs. A. E. Joseph, 10523 Long Beach Blvd., Lynwood, Calif., tel. LOraine 6-8091.

FOR SALE—small animal hospital, southern California coast. Excellent practice, equipment, real estate, and goodwill. Apartment ideal for couple. Additional quarters for help. \$8,000 to handle. Address "Box A 2," c/o JOURNAL of the AVMA.

FOR SALE OR LEASE—to veterinarian with small animal experience capable of managing busy practice. New, fully equipped hospital in New York State. Owner being called into service. Address "Box X 10," c/o JOURNAL of the AVMA.

FOR SALE—mixed practice in city of 50,000 in northern Illinois. Office and apartment located downtown. Excellent business established. Address "Box A 3," c/o JOURNAL of the AVMA.

Remittance must accompany order

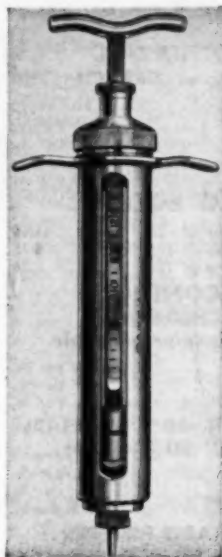
(Continued on p. 58)

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(CLASSIFIED ADS — Continued from p. 57)

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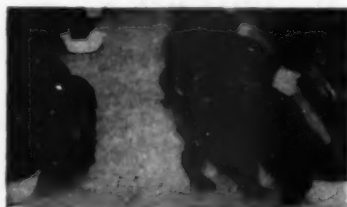
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(Continued on p. 59)



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(CLASSIFIED ADS — Continued from p. 58)

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